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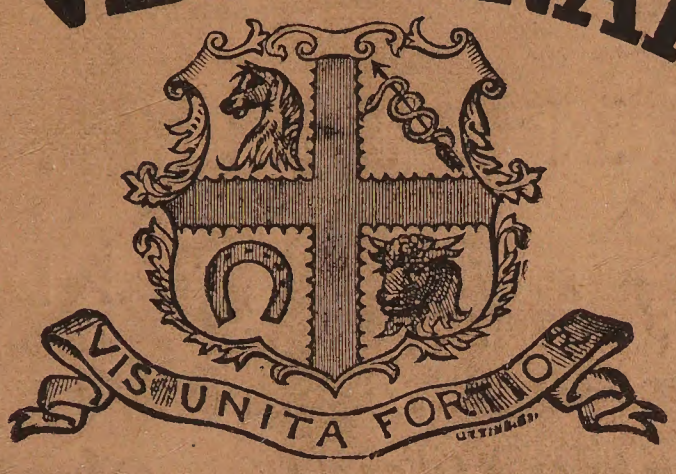

A MONTHLY JOURNAL OF VETERINARY SCIENCE.

AUGUST, 1890.

EDITED BY

PROFESSORS SIMONDS, BROWN, AXE AND McCALL.

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BOOKS, ETC., RECEIVED.

Annual Report of the Stock and Brand Branch Department of Mines (New South Wales).

The Journal of the Royal Agricultural Society of England, June, 1890.

The Animal Parasites of Sheep, by Cooper Curtice, D.V.S., M.D. (U. S. Department of Agriculture, Bureau of Animal Industry).

The Journal of Comparative Medicine and Veterinary Archives, June and July.

The Quarterly Journal of Veterinary Science in India, May.

The following foreign publications are to hand:—*Annales de Medecine Vétérinaire*, June, 1890; *Oesterreichische Monatsschrift für Thierheilkunde, und Revue für Thierheilkunde und Thierzucht*, July and August, 1890; *Archivio per le Scienze Mediche, La Clinica Veterinaria* (Milan), May, 1890; *Zeitschrift für Veterinärkunde mit besonderer Berücksichtigung der Hygiene*, Berlin, July, 1890; *Il Moderno Zooiatro*, Num. 8; *Wiener Landwirthschaftliche Zeitung; Recueil de Médecine Vétérinaire; Oesterreichische Forst-Zeitung; Land-und forstwirthschaftliche Ausstellung-Zeitung; Ueber Feuerbestattung; Sulla Utilità Pratica della Disinfezioni degli Ambienti nel Tetano Enzootico*, and *Journal of the National Agricultural Society of Victoria*, Vol. V, No. 58.

Papers received: *Mark Lane Express*, *North British Agriculturist*, *Land and Water*, *The Field*, *Live Stock Journal*, *Bell's Weekly Messenger*, *Agricultural Gazette*, *Farmers' Gazette*, Dublin; *Isle of Wight Observer and Chronicle*, *The Isle of Wight County Press*, *The Andover Observer*, *The Gazette*, Montreal; *The Evening Dispatch*, Edinburgh; *Macclesfield County Herald*, *The Licensed Victualler's Mirror*, and *The Peterborough Advertiser*.

It is particularly requested that in future the British and Foreign Exchange Journals be directed to the EDITORS of the *Veterinarian*, 22½, Bartholomew Close, London, E.C.

NOTICE TO CORRESPONDENTS.

Communications are to hand from Professor Axe and the Central Veterinary Medical Society.

To ensure the publication of Cases and Communications in the coming Number they should arrive by the 15th of the Month.

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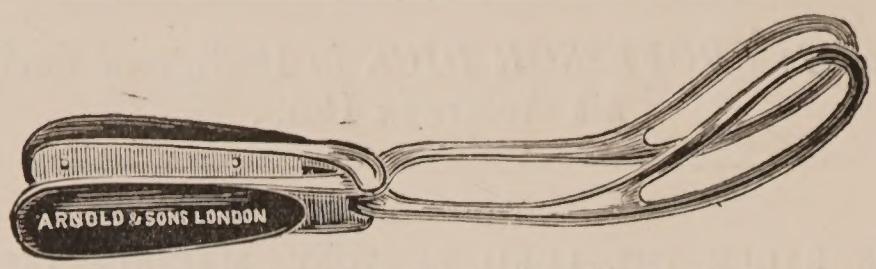

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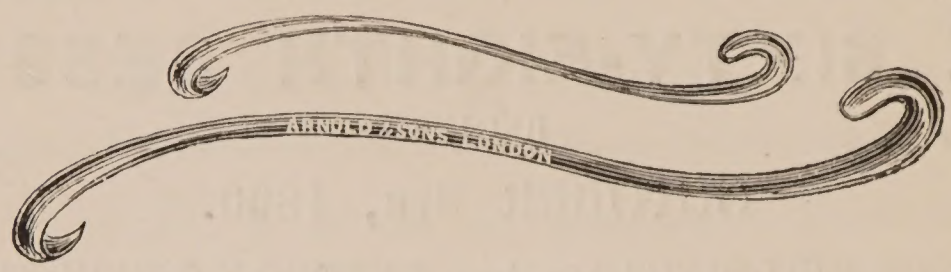

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THE

VETERINARIAN.

VOL. LXIII. No. 752. AUGUST, 1890. Fourth Series, No. 428.

Communications and Cases.

POISONING OF CLYDESDALES WITH MEAL OF THE INDIAN VETCH, *LATHYRUS SATIVUS*.

By Professor McCall, Principal of the Glasgow Veterinary College.

In the November and December numbers of the *Veterinarian* for the year 1886, I gave in detail a description of the poisoning of a number of horses by partaking of the Indian vetch *Lathyrus sativus ;* and as it is highly probable that horses are continuing to be poisoned, unknown to their proprietors and veterinary attendants, by eating the peas mixed with their oats, or ground into meal, I consider it my duty to again call the attention of the profession to the subject.

Having on the occasions referred to given the history, symptoms, and *post-mortem* appearances in "*Lathyrus* poisoning," both accidentally and experimentally produced, I shall not repeat what has been stated, but simply transcribe to the pages of the *Veterinarian* the correspondence which has been addressed to me by a professional brother, and connected with the most recent cases of poisoning.

"*June 24th*, 1890.

"Dear Sir,—I have sent you the larynx and stomach of a mare which died last night. This is the second case on the same farm within a fortnight. Unfortunately I did not

make a *post-mortem* on the first case, although I saw the mare often before she died. The symptoms were as follows: The animals appeared in perfect health—in fact, were improving rapidly in condition for some time prior to death. When made to do a little rapid exercise, or even to make a sudden start, they were seized with great difficulty in breathing and made a loud roaring sound. They then probably fell down, and were unable to get up for some time. When they rose again they seemed all right. The first was a "Darnley" mare, five years old, and was troubled about six weeks with the disease. About five minutes before she died she was playing by herself in the field, when she was seen to stagger and fall, and died almost immediately. The next mare, her mother, about twelve years of age, was within a few days of foaling. About eight o'clock last night she seemed pained, and the farmer went to get some assistance, as he thought she was for foaling; but on coming back to her she was found lying dead. I made the *post-mortem* examination to-day. There had been a lot of frothy blood coming away from the nostrils; the trachea and all the tubes were filled with the same. I traced both nerves down the neck and into the chest, but could find no trace of disease about them. The lungs were apparently healthy, but quite blue in colour. In fact the mare seemed to have died from suffocation caused by 'spasm of the larynx.' Now, this farmer has been feeding on ground *Indian peas mixed with bean-meal*, but the last mare had been running at the grass for a fortnight, and getting no house-feeding at all. I will try, if possible, to get a few of the peas as they come here before they are washed.

"From what I can make out they seem to be a small black pea about the size of 'shot lead.' If you could examine the larynx and stomach, and let me know what you think about them, I would be greatly obliged to you."

To this letter a telegram was sent: "Mares poisoned by *Lathyrus sativus:* stop the pea-meal at once. Letter follows."

"*July* 10*th*, 1890.

"DEAR SIR,—I must thank you for your telegram and letter. Regarding the particulars of the two cases, they are as follows: The horses on the farm of —— were being fed, viz. a morning and mid-day feed of oats and raw turnips and an evening feed of pulped turnips and mash with a small pailful of Indian pea-meal, amongst ten animals. Each animal would be receiving little more than *half a pound* of

the meal. They received this feeding from New Year till the middle of May. I was called in to see a three-year-old mare about the 18th of May, and from what I could learn about her the farmer was of opinion that the animal had been suffering from cold and had been choked. I blistered her throat, and put her on soft meat and grass. She was brought in to me again on the 2nd of June. I had not seen her up till then in any of her ill turns. That day she fell down on the road coming in. On seeing her I suspected the peas as having something to do with the trouble. I again blistered her throat and gullet, put her on iodide of potass, and had her kept in a loose box. I visited her on the 10th of June, and had her out and trotted repeatedly along the road. She was then in good heart, and apparently very little the matter with her wind. I thought when she was doing so well it was a pity to keep her in the house, so I had let her out into a plantation beside her box and watched her for a time; the trees I considered would prevent her taking any stretch of a gallop. I watched her for about ten minutes, when she seemed to be settled and all right. The farmer accompanied me up the road a bit; and, on returning, in about twenty minutes, the mare was lying dead. The second mare died the day previous to your receiving the specimens. I never saw her in life with regard to her illness. She was a Lord Lyon mare, and had been a roarer for years, and from what I could learn she had had some attacks similar to the mare that died before. The rest of the horses all appear quite healthy. I may also state that the peas were thoroughly washed here before being milled. Enclosed are a few of the peas, which I obtained from the mill.

"Thanking you for your kindness, I remain, &c."

The only points of interest in the above cases, as contrasted with those enumerated in 1886, is the long period of time the peas were administered before the fatal result, and I apprehend this is due to the small quantity (about half a pound) daily allowed.

As regards the condition of the stomach, its walls were slightly thickened and congested, and the muscles on the left side of the larynx were atrophied.

The peas received were the *Lathyrus sativus*.

"CATTLE DOCTORS DIFFERING."

By the Same.

Under the above title the *North British Agriculturist* and other papers have circulated a report as issuing from the Local Authority of the county of Fife regarding a disputed case of pleuro-pneumonia, in which it is stated *inter alia* that a third portion of the lung of the animal "had been sent to Principal McCall, and his reply was that the specimen sent had been so long in spirits he could not pronounce any positive opinion on the disease; and in the circumstances it was agreed to isolate the herd in which the above animal was found."

In justice to all parties, and as advised by an esteemed *confrère*, I think it my duty to refer to the subject, and to state the circumstances known to me.

I was out of town when the parcel referred to arrived, had no personal interview with any one, and, as my opinion was desired for a meeting to be held within two hours of my seeing the specimen, I wired: "Specimen so changed by the action of spirit, cannot say *positively* whether chronic pleuro-pneumonia or contagious pleuro-pneumonia, but would advise isolation of the stock."

Now, I hold, no person placed as I was could have honestly said more. The portion of lung sent to me was contained in a small glass bottle; it was sliced into thin portions, and, being soaked in spirit, its colour (a point of the greatest importance) was entirely removed; and, moreover, the portion of lung sent was *all diseased*, and in the same stage of hepatisation.

It is admitted by the most experienced veterinarians to be beyond their power to distinguish between a case of contagious pleuro-pneumonia and non-contagious pleuro-pneumonia in the living subject, and I would go the length of saying that a *thoroughly reliable opinion* cannot be given by any veterinarian unless he has had an opportunity of examining the lungs shortly after death, and at all events before they have been cut into thin slices and soaked in spirit or other fluid which removes the colours.

In contagious pleuro-pneumonia *sound* portions of lung-tissue can be found and cut out, even in the most advanced cases; and if care be exercised portions of sound lung, surrounded by diseased portions in the *earliest stages* of the

disease, may also be excised; and, further, a practical hand can find and excise portions of sound tissue immediately adjoining portions of tissue in the *most advanced stages of the malady*. Now, if such be facts, how easy is it to mislead the most experienced! Or, if any one objects to that view of the subject as being a reflection on the honesty of the person or persons excising the lungs (which I do not want to imply), then I say it is unfair and a mere conjecture on the part of any professional man, however great his experience and exalted his position, to pronounce an authoritative opinion on a small portion of lung cut in thin slices soaked in spirit, devoid of colour, or as it is called "marbling," and the whole piece in the same stage of hepatisation.

It is true that proliferation of connective tissue and pronounced hepatisation, as in the portion of lung sent to me, are marked features in contagious pleuro-pneumonia; and in the majority of cases a practitioner placed as I was would be right if he *hazarded an opinion* that the case was one of pleuro-pneumonia contagiosa; but I need scarcely say that proliferation of connective tissue and pronounced hepatisation are also marked lesions in non-contagious pleuro-pneumonia of a chronic type, and therefore it appears to me that veterinarians are only warranted in pronouncing opinions as betwixt these two diseases in cattle when they have had (1) an opportunity of examining the lungs *in toto*, or (2) a considerable portion of them, and not less than a section extending from one side of the lung to the other, and including diseased and sound tissue as there located. The breadth of the portion I consider should not be less than six inches. It should on no account be sliced and soaked in spirit, but wrapped in plics of clean cloth steeped in spirit and enveloped in a portion of mackintosh or oiled silk. A portion of lung treated in this way and enclosed in a tin biscuit-box will keep fresh for a length of time, and when cut in slices will present the characteristic naked-eye appearances on which we all rely and are agreed, but when defaced we hesitate or differ in our opinion.

I am certain that there would have been neither hesitancy nor difference of opinion had Professors Brown, Walley, Williams, and myself been given an opportunity of examining the lungs under such conditions as I have stated; and I would earnestly entreat all who desire the opinion of professional experts, not present at the *post-mortem* examination, to give them a fair chance by carrying out the instructions I have indicated.

IS DISHORNING CATTLE CRUELTY?

By Thomas Greaves, F.R.C.V.S., Manchester.

The case just decided by the magistrates at Kells settles the question, so far as it goes, *that dishorning is not cruelty*. The case was carefully, scientifically, and thoroughly gone into, occupying three days. There were eminent witnesses who gave the highest evidence on the side of the Society for the Prevention of Cruelty to Animals. There were also eminent witnesses who gave equally high evidence, showing the necessity and the reasonableness of dishorning. It is not contended that the operation can be performed without more or less pain; but the advantages attainable by the operation of dishorning are out of all proportion to the pain inflicted or suffered by the animal, which it was contended was trifling, it being almost instantaneous, and the suffering which followed being only of short duration. It was proved that the operation was for the benefit of the animal, and for the owner as a grazier. The magistrates said: "We are satisfied on the evidence that the dishorning of cattle increases their market value, renders them more saleable, is customary, and if suppressed would inflict very large pecuniary loss on the community. Cattle when dishorned appear to thrive better, to become quieter, and to be more easily handled. They are also less dangerous to man and to each other, and less liable to suffering on pasture and when travelling." It was further proved that no other method could be adopted that would secure so beneficial a result; that partial dishorning and affixing tips or knobs on the ends of the horns were of little or no use.

My evidence went to show that I had been in practice as a general practitioner for fifty-five years, and was the appointed consulting veterinary surgeon to the Royal Society for the Prevention of Cruelty to Animals in Manchester for twenty-five years; that my experience and opportunities of judging of cases of cruelty had been considerable; that I had performed this operation myself and had seen it performed by others; and that when properly done it did not take many seconds. I had noted with close observation the amount of pain inflicted, and felt clear on the point that the degree of pain suffered did not amount to cruelty; and, further, that the after-pain was of short duration, and that it did not amount to cruelty.

The moment the horn is removed the blood spurts out for

a yard or more. I have seen it spurt out over two yards, but if left alone it will stop of itself in two or three minutes; but if you place the thumb or finger on it firmly for half a minute it will stop it entirely. It requires nothing more being done. Indeed, it is altogether unnecessary to do anything whatever; no tar, no tow being required. The bleeding will rather do good by lessening the tendency to inflammation. If we examine the sawn surfaces of horn in two or three hours after the operation, we shall find that they have become dry; that a dry film has covered them which effectually excludes the air, so that neither inflammation nor suppuration follows. In two or three days all tenderness and soreness are gone. It is my firm opinion that the prevailing notion in some places that the operation is attended with great pain is greatly exaggerated, and that much of this supposition has its base in sentiment.

For many years I held the opinion that general dishorning was unnecessary. I took a humanity-to-animals view of it. I thought if the ill-tempered animals in the herd (and there are always ten or twelve tyrants or bullies in every herd of fifty or sixty head of cattle) were dishorned that this would meet the case; that these, being dishorned, would become quiet and peaceful animals by finding they had now no weapons of offence, and that the others of the herd would consequently have no longer any terror of them. I also thought that as these discontinued the habit of running the other cattle from pillar to post that peace and comfort would reign throughout the herd; but in this I was wrong, for it is immediately seen—it being the nature of the animals for the strong to tyrannise over the weak—that the next ten or twelve biggest and strongest now take the place of those dishorned. You may dishorn these, and others will soon be seen to take their place. This spirit seems to be in their nature. They will all do it, from the biggest and strongest to the weakest; hence it follows that the whole herd should be dishorned. Thus you secure peace, and comfort, and happiness, for otherwise quiet life is impossible to exist. The animals can now lie down together and quietly chew the cud; they can feed together, and can be driven in droves without molesting one another.

I remember, when I was young, up to sixteen years of age I lived on the high-road side from Liverpool to Manchester, to have seen hundreds of droves of Irish cattle driven to Manchester Market, and had witnessed hundreds of instances of this tyrannising and bullying spirit of the strong over the weak. Once I can remember that my father

took me, my brother, and sister into the road, and showed us a pool of blood, and told us that one of the herd of cattle had run its horn into the side of another one, and that the blood flowed out and it died, and was carted to Manchester Market. Since then I have seen dozens of horses and cattle die horrible deaths caused by being gored by the horns of cattle.

ARAB HORSE-SHOEING.

By William Littlewood, M.R.C.V.S., Sanitary Administration, Cairo.

Mr. Broad's remarks on Arab shoeing in his "report on the competition for horse-shoeing at Exeter," as published in your Journal of May, 1890, hardly coincides with facts observed by me during the last four years.

If the Arab shoe will, as it does, protect horses' feet when galloping in the desert, which is at times hard and rough, it would, I should think, protect horses' feet on an English road. In Cairo the roads are macadamised, and in Alexandria paved, and in both these towns I have seen horses going very well with the desert shoe. All donkeys and many mules are similarly shod. The shoes last a long time, as the nail heads do not come off, but wear down more or less quickly, according to the amount of work done.

Further, all Arab horses' feet are not *concave, like donkeys'*; it depends entirely, in my opinion, on their rearing ground, as, for instance, in the Delta the majority of Arab horses reared there are decidedly inclined to be flat footed.

In shoeing, the Arab smith, when not influenced by European ideas, never pares away the sole, but allows frog, sole, and wall to grow down together; and before putting on the shoe a complete slice is taken off the bottom surface of the foot. The great objection to the desert shoe is that, if allowed to remain on too long and the animals to stand in filthy stables, the frog becomes injured by continued attacks of thrush.

Pharmacy and Therapeutics.

TEST FOR ALBUMEN IN URINE.

Reliable and easily applied tests for determining the amount of albumen in urine are always of interest to the

general practitioner. A new one for this purpose is recommended by Herr Zonchlos (*Pharm. Centralh.*, June 12th, p. 353). It is prepared by mixing 10 c.c. of a 10 per cent. solution of potassium sulphocyanide with 2 c.c. of acetic acid. If a few drops of this liquid (which can be kept without change for a long time) be added to the albuminous urine, it immediately produces a turbidity or a precipitate, according to the amount of albumen present. Herr Zonchlos asserts that this test is more delicate and reliable than the potassium ferrocyanide and acetic acid solution, and has also the advantage of being colourless. As potassium sulphocyanide and succinic acid are said to act in a similar manner, Zonchlos suggests that they would be more convenient for clinical use, as they could be carried about separately in a dry state, and even mixed together, and deliquescence avoided if enclosed in a gelatine capsule.

TOXIC EFFECTS OF ANTIPYRIN.

Our contemporary, the *Pharm. Journal and Trans.*, June 28th, p. 1059, has an extract from an article by Dr. Schwabe (*Apot. Zeit.*, June 14th, p. 322), where it is reported that violent toxic symptoms were observed in a young woman who had been ordered antipyrin in 1-gramme doses (15 grains) for severe neuralgic pains. Three minutes subsequently to taking a dose at noon, after a meal, she complained of a peculiar oppressive pain in the back of the head. This was followed quickly by singing in the ears, giddiness, and a feeling of anxiety; then by tumultous heart-beat, difficulty of breathing, cold sweat, a strong feeling of heat on the right side of the body, and of cold and numbness on the left. In twenty minutes the sight was affected followed by complete amaurosis, lasting half an hour, when it gradually disappeared. The heart disturbance was excessive, the beats numbering 200 to the minute during the first hour; the speech was also affected. The symptoms perceptibly decreased during the afternoon and evening, but the patient felt very ill during the next two days, though she eventually recovered without any permanent injury. In a former communication (vide *Veterinarian*, Feb., 1887, p. 101) we gave a full physiological history of antipyrin on the lower animals, where it was shown that when given to rabbits in gramme doses it produced increased elevation of blood-pressure, followed by violent tetanic cramps, lowering of the blood-pressure, and decrease of reflex excitability, and the heart continued to beat violently after the blood-pressure was nearly reduced to zero, and death ensued by complete

failure of the respiration. We further pointed out (loc. cit.) that when 3 grammes (45 grains) were given to a rabbit, it produced cataleptic stiffness, paraplegia, followed by violent convulsions of an epileptic character, and very rapid lowering of bodily temperature. Having already commented fully (loc. cit.) on the therapeutics of antipyrin, we have only to add that since we introduced it to the notice of the profession it has proved useful for the purpose of lowering temperature in typhoid, influenza, pneumonia, and other high fevers, but it is a drug that requires the necessary care of the trained veterinarian, and in no case should it be administered if there should exist any complicated cardiac trouble. Mr. Urquhart, M.R.C.V.S., Ipswich, a great authority on heart disease, has particularly drawn the attention of the writer to this.

PROTECTIVE GAUZE TISSUE.

A new absorbent non-adhesive protective gauze tissue is highly recommended by Dr. Renton, of Edinburgh (*British Medical Journal*, June 14th, p. 1367), contrived for the purpose of preventing the gauze or other dressings from sticking to the wound, and still allowing all discharge to be absorbed through it. His mode of preparing it is by stretching ordinary coarse pale book-muslin on frames, and soaking it with a mixture of isinglass, glycerine, water, aniline solution, bichloride of mercury solution (1 in 4000), and chloride of ammonium. When dry it is permanent and antiseptic. Dr. Renton asserts that, in using this, complete absorption of any discharge is allowed, whilst sufficient dissolved isinglass remains as a coating over the wound which prevents adhesion of the tissue, and has the advantage of allowing the surgeon to remove the dressing without pain.

Pathological Contributions.

THE TUBERCULOSIS COMMISSION.

The Royal Commission to inquire into the effect of food derived from tuberculous animals on human health, is nominated in the *Gazette* as under: — Baron Basing; George T. Brown, C.B.; George Buchanan, F.R.C.P.; Joseph Frank Payne, F.R.C.P.; John B. Sanderson, F.R.C.P.

TUBERCULOSIS IN THE FOWL.

"Dr. Angelo Mafucci, of Pisa, has made some important observations upon tuberculosis in fowls (*Centralbl. für Allg. Path. u. Path. Anat.*, No. 13), which go some way to show that there is an integral difference between that affection and the analogous disease in mammalian animals. The question is obviously of moment in regard to the possibility of transmission of tubercle to man. After giving the results of his inquiry, he says that there are three questions yet to be solved—viz.: (1) whether there exists in man a form of tuberculosis, local or general, similar to that of fowls; (2) whether one of these two forms is an attenuation of the other, and if so, which? Hitherto he has failed to transmit by successive inoculation 'fowl tuberculosis' from guinea-pig to guinea-pig, or mammalian tubercle from fowl to fowl. And (3) whether the two forms of tuberculosis may have a common origin, modified in the different classes of animals. Nocard states that the fowl can be attacked with bovine tuberculosis, but Mafucci has been unable to confirm this. The facts which he has ascertained so far are as follows:—1. That fowl tuberculosis differs in its cultures from mammalian tuberculosis. 2. That fowl tuberculosis may be well cultivated and retain its pathogenic properties between 37° and 43° C. 3. That the guinea-pig and dog are able to destroy the bacillus of fowl tuberculosis, its inoculation in them often resulting in local abscesses. 4. That the guinea-pig may die of marasmus, without any tuberculous nodules forming, up to within four months after inoculation. 5. That the rabbit may exhibit the general as well as the local form of tuberculosis, but with a special type of structure of the tubercle and a greater quantity of bacilli than occurs in fowls. 6. That tuberculosis of fowls has great power of resistance to physical agents. 7. That the fowl is insusceptible to mammalian tuberculosis."—*Lancet.*

TUBERCULOUS CATTLE.

The following official statistics relating to the public slaughterhouse of Augsburg, may be interesting:—During 1889, of 23,592 calves slaughtered, only one (an animal three weeks old) was found to be tuberculous. Of 13,679 head of older cattle, 612, or 4·4 per cent., were tuberculous. Of 8537 oxen, 167, or 1·94 per cent., were tuberculous; while of 5008 cows, 445, or 8·88 per cent., were affected with that disease. In 4 cases, or almost 1 per cent. of the cows, the udder was the seat of tuberculosis. In 67 of the

612 cases in which disease was discovered, the flesh was declared unfit for food on account of generalised tuberculosis and destroyed.—*Brit. Med. Journ.*

PLEURO-PNEUMONIA IN AMERICA.

"In the newly issued report of the Secretary of Agriculture for the United States the following paragraph appears:—"Including all the districts in which pleuro-pneumonia has existed there were inspected from December 1st, 1888, to November 30th, 1889, a total of 36,531 herds, containing 329,000 animals. There were 222 new herds found to be affected with pleuro-pneumonia, and these herds contained 4273 animals, 351 of which were pronounced diseased when the inspections were made. There were purchased for slaughter 1241 affected cattle, also 3845 exposed cattle. It has been found necessary to disinfect 588 stables, stock-yards, or other premises; and also to make *post-mortem* examinations upon the carcases of 54,520 bovine animals, of which 1294 were found diseased with pleuro-pneumonia." The disease existed in portions of the States of New York, New Jersey, Pennsylvania, and Maryland. We read in the report of the chief of the Bureau of Animal Industry that great opposition has been encountered in eradicating the disease, the regulations having in some cases been flagrantly and persistently violated, and officers having been assaulted. In these circumstances is it not possible that even the foregoing is an incomplete record? We do not comment on the statistics; they speak for themselves.—*Farming World, July 18th*, 1890.

PLEURO-PNEUMONIA.

In Great Britain during the four weeks ending July 12th there were 68 fresh outbreaks of this disease reported, 53 of them in England, in the counties of Chester, Cumberland, Essex, Kent, Lancaster, London, Middlesex, Norfolk, Northumberland, Surrey, and York (West Riding). The disease has during the period mentioned been most prevalent in Lancashire, no less than 29 of the 53 outbreaks in England having occurred in that county. The 15 outbreaks in Scotland took place in the counties of Aberdeen, Edinburgh, Fife, Lanark, and Renfrew; 9 of these outbreaks were in Edinburgh, which has for some time been the chief centre of disease in Scotland as Lancashire has been in England. It may be noted that these two counties furnish more than half the total outbreaks in the whole of Great Britain in the four weeks mentioned. The total

number of cattle found affected with pleuro-pneumonia in Great Britain in the four weeks was 237, of which 168 were in England and 69 in Scotland. The number of healthy cattle slaughtered because they had been exposed to the risk of infection was 1134, 865 of which were in England and 269 in Scotland.

In Ireland the infection of pleuro-pneumonia still maintains an existence, but has recently been confined to the districts of the North and South Dublin Unions. During the four weeks ending July 12th there were 9 fresh outbreaks of pleuro-pneumonia reported in Ireland, 18 cattle attacked, and 290 healthy animals which had been exposed to infection slaughtered.

ANTHRAX.

There were 7 fresh outbreaks of this disease reported in Great Britain in the four weeks; the whole of these occurred in England, in the counties of Bucks, Dorset, Kent, Lincoln (Lindsey), Stafford, and Suffolk. The number of animals attacked with anthrax in England was 48; 3 of the animals affected were killed, 18 died, and 24 recovered. Only 1 outbreak of this disease was reported in Ireland in the four weeks. This occurred in the county of Kilkenny; 1 animal was attacked and died.

SWINE FEVER.

Of this disease 604 fresh outbreaks were reported in Great Britain in the four weeks—3064 swine were attacked; 1225 diseased pigs were killed, 1284 died, 315 recovered, and 830 remained alive at the end of the week when the return was made up.

In Ireland there were 47 outbreaks of swine fever reported and 139 swine attacked.

RABIES.

In England 16 cases of this disease were reported in the four weeks, in the counties of Bucks, Lancaster, Middlesex, Norfolk, Northampton, Stafford, Warwick, and York (West Riding). Of the animals affected 15 were dogs and 1 was a pig.

In Ireland this disease is much more prevalent than in England. There were 44 cases in the four weeks, 31 in dogs, 10 in cattle, 2 in sheep, and 1 in a donkey. They occurred in Carlow, Cavan, Clare, Cork, Dublin, Kerry, Kilkenny, Limerick, Mayo, Queen's County, Tyrone, and Wexford.

THE VETERINARIAN, AUGUST 1, 1890.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

THE PLEURO-PNEUMONIA ACT.

IN the present number of the *Veterinarian* we publish the short Amendment Act, which gives special powers to the Board of Agriculture to deal with pleuro-pneumonia—chiefly power to slaughter cattle and pay compensation out of Imperial funds.

Under the Contagious Diseases (Animals) Act of 1878 Local Authorities are compelled to slaughter cattle affected with pleuro-pneumonia, and may, if they think fit, slaughter all cattle which have been in contact with cattle so affected. Having slaughtered cattle under these powers, Local Authorities are directed to pay compensation out of the local rates.

By the terms of the new Act, which will come into operation on September 1st, power to slaughter and power to pay are taken from Local Authorities and conferred upon the Board of Agriculture. But it must be clearly understood that all the other powers which are delegated to Local Authorities by the terms of the Act of 1878 still remain undisturbed. The powers which they enjoy under the various Orders are liable to revocation or modification by the Board of Agriculture.

Veterinary inspectors of Local Authorities will be anxious to know to what extent their action will be affected under the new conditions which will be created as soon as the Pleuro-pneumonia Act comes into operation; and we propose to suggest for their guidance what appears to us to be the obvious rendering of the new Act taken in connection, as it must be, with the principal Act of 1878.

First, the veterinary inspector of a Local Authority remains in his present position. But, in regard to pleuro-pneumonia, he has no longer any power to slaughter. His procedure up to this point will be as it now is, *i. e.* in accordance with the system adopted in his district; and, for the sake of clearness, the system may be divided into two sections.

Under section 1 the veterinary inspector is also the inspector. In section 2 he is not the inspector, but is called in as an expert to assist the Local Authority in inquiring

into the correctness of the inspector's declaration of the existence of pleuro-pneumonia. And it may be remarked here that the Act of 1878 most clearly contemplates a declaration being made by the inspector before slaughter.

When the first system is in operation in a district, *i. e.* where all the local inspectors and veterinary inspectors commonly have delegated to them power to slaughter, they often exercise this power when they are pretty sure of the existence of disease before they make a declaration, a procedure which is not legal, although it works quite satisfactorily under circumstances above described.

It is of the greatest importance for the members of our profession who are veterinary inspectors to understand that after the end of August they must not, under any circumstances, order the slaughter of cattle until they are directed by the Board of Agriculture, otherwise they may find themselves in a difficulty from which it may not be possible to extricate themselves.

The plain duty of the veterinary inspector, who is also the inspector, is to attend on receipt of notice of disease, no matter how the information is given; and if *it appears* to him that pleuro-pneumonia exists, he is bound to make and sign a declaration, serve a notice on the owner of the premises, inform the Local Authority and the Board of Agriculture, and wait for further information. It follows that, for the duties which the Board may impose on the veterinary inspector, they will award him proper remuneration; but, until he has definite instructions, he will continue the officer of the Local Authority.

Section 2 of the system of local inspection shows a different mode of action. In this case the inspector is generally a police constable, or some one not qualified as a veterinary expert. On receipt of notice of disease the inspector proceeds as before described, makes and signs a declaration, gives notice to the owner of the diseased cattle, informs the Local Authority and the Board of Agriculture. The police constable is immediately authorised by the Local Authority to obtain the assistance of the veterinary inspector, and when this plan is followed time is saved, because the Act of 1878 provides that the veterinary inspector must be consulted before the existence of pleuro-pneumonia is confirmed.

Under either of the two courses the veterinary officer of the Local Authority is bound to stop at the point where he has sufficient evidence to enable him to declare that it appears to him that pleuro-pneumonia exists. His further procedure

will be of necessity under the instruction of the Board of Agriculture.

One other matter which concerns the whole veterinary profession requires a few words of comment. We take it as an admitted fact that the extinction of animal plagues would, by increasing the breeding of animals and adding to the prosperity of owners of stock, tend to benefit the veterinary profession. No argument is necessary to prove that the success of the stamping-out system depends, to a great extent, on early notification of disease; and in this direction every veterinary surgeon in the kingdom can render important aid to the Authorities who are charged with a most urgent duty.

CONTAGIOUS DISEASES (ANIMALS) (PLEURO-PNEUMONIA) ACT, 1890.

Chapter 14.

An Act for conferring further Powers under the Contagious Diseases (Animals) Acts, 1878 to 1886, with respect to Pleuro-pneumonia. [4th July, 1890.]

BE it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1.—(1.) The Board of Agriculture shall cause to be slaughtered all cattle affected with pleuro-pneumonia.

(2.) The Board of Agriculture may, if they think fit, in any case cause to be slaughtered:—

(*a.*) any cattle suspected of being affected with pleuro-pneumonia; and

(*b.*) any cattle which are or which have been in the same field, shed, or other place, or in the same herd, or otherwise in contact with cattle affected with pleuro-pneumonia, or which appear to the Board to have been in any way exposed to the infection of pleuro-pneumonia.

(3.) There shall be paid such compensation for animals slaughtered under this section as is specified under section twenty-one of the principal Act.

(4.) Where the Board of Agriculture have decided that any head of cattle is to be slaughtered under this section the Board shall, if the owner of such head of cattle by notice in writing so require, cause the same to be slaughtered within twenty-one days after the receipt of such notice.

(5.) The Board of Agriculture may, for the purposes of the

execution of this Act, employ such additional inspectors, valuers, and other persons, and at such remuneration, and may incur such expenses as, subject to the sanction of the Treasury, they think necessary.

2.—(1.) For the purposes of this Act, so far as the same relates to Great Britain, there shall be opened an account at the Bank of England (in this Act referred to as the Cattle Pleuro-pneumonia Account for Great Britain).

(2.) There shall be paid to the said Account—

(*a.*) Such moneys (not exceeding one hundred and forty thousand pounds in any one year) as may be provided by Parliament towards defraying the costs of the execution of this Act in Great Britain; and

(*b.*) All sums received by the Board of Agriculture on the sale of the carcases of cattle slaughtered under this Act, after deducting any amounts payable to the owners of such cattle under the third sub-section of section thirty of the principal Act.

(3.) The costs of the execution of this Act in Great Britain shall be paid by the Board of Agriculture out of the moneys standing to the Cattle Pleuro-pneumonia Account for Great Britain.

(4.) If in any financial year the money standing to that Account is insufficient to defray the costs of the execution of this Act in Great Britain, the Local Government Board and the Secretary for Scotland shall, out of the Local Taxation Account and the Local Taxation (Scotland) Account respectively, pay to the Cattle Pleuro-pneumonia Account for Great Britain in the proportions provided by this Act, such additional sums as may be certified by the Board of Agriculture to be required for defraying such costs.

3. The inspector of the local authority who has made a declaration and served a notice under section sixteen of the principal Act, shall, in addition to the duties imposed upon him by that section, with all practicable speed, inform the Board of Agriculture of such declaration and notice and send a copy of the same to the Board of Agriculture.

4.—(1.) For the purpose of ascertaining whether pleuro-pneumonia exists or has within fifty-six days existed in any cowshed, land, or other place, an inspector of the Board of Agriculture may at any time enter such cowshed, land, or place.

(2.) The powers conferred upon an inspector of the Board of Agriculture by this section shall be in addition to those conferred upon him by section fifty-one of the principal Act.

5. This Act shall apply to Ireland subject to the modifications and provisions contained in Part IV of the principal Act, and in this section.

(1.) The Lord Lieutenant and Privy Council shall be substituted for the Board of Agriculture.

(2.) There shall be paid to the General Cattle Diseases Fund—

(*a.*) Such moneys (not exceeding twenty thousand pounds in any one year) as may be provided by Parliament towards defraying the costs of the execution of this Act in Ireland; and

(*b.*) All sums received by the Lord Lieutenant and Privy Council on the sale of the carcases of cattle slaughtered under this Act, after deducting any amounts payable to the owners of such cattle under the third sub-section of section thirty of the principal Act;

and the amounts so paid shall be carried to a separate account to be called the Cattle Pleuro-pneumonia Account of the said Fund, and shall be applicable solely to the purposes of this Act.

(3.) The costs of the execution of this Act in Ireland shall be paid by the Lord Lieutenant and Privy Council out of the moneys standing to the Cattle Pleuro-pneumonia Account of the General Cattle Diseases Fund, and if those moneys are insufficient shall be paid out of the general account of that Fund.

(4.) All expenses (including compensation for animals slaughtered) incurred before the commencement of this Act by any local authority or by or on behalf of the Lord Lieutenant and Privy Council in executing and enforcing the provisions of the Pleuro-pneumonia Slaughter (Ireland) Order of 1888 (which order was made by the Lord Lieutenant and Privy Council under the Contagious Diseases (Animals) Acts, 1878 to 1886, on the sixth day of March, 1888), shall be charged to and defrayed out of the Cattle Pleuro-pneumonia Account of the General Cattle Diseases Fund.

6.—(1.) At the end of every financial year accounts of the receipts and expenditure of the Cattle Pleuro-pneumonia Accounts established under this Act shall be made up in such form and with such particulars as may be directed by the Treasury, and such accounts shall be audited by the Comptroller and Auditor-General as public accounts in accordance with such regulations as the Treasury may make, and shall be laid before Parliament together with his report thereon.

(2.) If at the end of any financial year the Treasury, after communication with the Board of Agriculture or the Lord Lieutenant and Privy Council as the case may be, are satisfied that the balance standing to the credit of either of the said Cattle Pleuro-pneumonia Accounts or any part of such balance will not be required for the purposes of this Act, they may—

(*a.*) In the case of the Cattle Pleuro-pneumonia Account for Great Britain direct such balance or part to be paid in the proportions provided by this section into the Local Taxation Account and the Local Taxation (Scotland) Account, in repayment of any sums which have been paid to the Cattle Pleuro-pneumonia Account out of the said Local Taxation Accounts; and

(*b.*) In the case of the Cattle Pleuro-pneumonia Account of the General Cattle Diseases Fund direct such balance or part to be paid into the general account of the said Fund in repayment of any sums which have been paid out of the said general account for the purposes of this Act;

and in either case the Treasury may direct any balance or part which may not be required for such repayment to be paid to the Exchequer.

(3.) The proportions in which any sum is to be paid out of or into the Local Taxation Account and the Local Taxation (Scotland) Account under this Act shall be eighty-eight per cent. of such sum out of or into the Local Taxation Account, and twelve per cent. out of or into the Local Taxation (Scotland) Account.

(4.) All moneys paid under this Act out of or into the Local Taxation Account shall in account be charged against or credited to the proceeds of the Probate Duty.

(5.) All moneys paid under this Act out of or into the Local Taxation (Scotland) Account shall in account be charged against or credited in manner provided by any Act hereafter passed respecting the application of any Customs or Excise Duties paid to the Local Taxation (Scotland) Account.

(6.) Payments out of and into the said Cattle Pleuro-pneumonia Accounts and all other matters relating to the accounts and to the moneys standing to the credit of the accounts shall be made and regulated in such manner as the Treasury direct.

7. Section twenty-one of the principal Act is hereby repealed from the beginning of the section to the words "under this section."

8.—(1.) This Act may be cited as the Contagious Diseases (Animals) (Pleuro-pneumonia) Act, 1890, and so far as is consistent with the tenor thereof shall be construed as one with the Contagious Diseases (Animals) Acts, 1878 to 1886.

(2.) The Contagious Diseases (Animals) Acts, 1878 to 1886, and this Act may be cited together as the Contagious Diseases (Animals) Acts, 1878 to 1890.

(3.) The Contagious Diseases (Animals) Act, 1878, is in this Act referred to as the principal Act.

9. This Act shall come into operation on the first day of September One thousand eight hundred and ninety.

Extracts from British and Foreign Journals.

REPORT ON THE MORPHOLOGY AND DEVELOPMENT OF THE BLOOD.

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(From the Surgical Laboratory of the University of Edinburgh.)

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Of late years the subject of blood, its morphology and development, has attracted the attention of observers, both at home and abroad, in an unusual degree; but while this has resulted in a considerable amount of observations being published, I feel that the statement of Virchow, that "the whole history of the red corpuscle is still invested with a mysterious obscurity, inasmuch as no positive information has, even at the present time, been obtained with regard to the origin of these elements. We know that in the first months of the existence even of the human embryo divisions take place in the cells, whereby an increase in the number of those present in the blood itself is produced. But after this time all is obscure, and this obscurity indeed corresponds pretty exactly with the period at which the corpuscles in the blood of man and the mammalia cease to exhibit nuclei. We can only say that we are acquainted with no fact whatever which speaks in favour of a further development, or of a cell division in the blood, but that everything points to the probability of a supply from without,"* is in a sense as true now as then, though I am hopeful that the following observations may add considerably to our knowledge of this most interesting and important subject.

About three years ago I had begun a series of investigations on the subject of suppuration, when I found that certain questions which I desired to answer must ever remain obscure until such time as further light could be thrown on the development of certain of the cells of the blood. Such information not being forthcoming, I was forced to turn my own attention to the subject, with what result this report may show; and I must offer this as my excuse for having taken up a research of a kind which, properly speaking, is somewhat out of the domain of my usual line of work.

The blood, as everyone is aware, consists of a fluid, the

* Virchow's 'Cellular Pathology,' p. 233, Sydenham Society.

liquor sanguinis, in which there float certain cellular bodies, the red and white corpuscles. I hope to show that there are present in the blood, besides the red and white corpuscles, other two kinds, together with a variable amount of an amorphous and granular material.

What I have now to say will be understood to apply only to the blood of man.

Red Corpuscles.—These are circular, homogeneous, discoid bodies, having on either side a shallow saucer-like depression; or, to use the familiar definition, they are circular, biconcave, non-nucleated discs, with a peculiar somewhat greenish-yellow colour. In a somewhat recent publication we are told by Mosso* that the biconcave condition is a pathologically induced condition, and that properly the real form is spherical. I cannot conceive how anyone can be excused for making such an erroneous statement, and do not consider it necessary for me to attempt to disprove an observation which is contrary to our best knowledge, and when their biconcave condition is a time-honoured fact. Their diameter varies considerably, even in the same drop of blood; but while we may estimate the average as something between 7·5μ and 8μ, it is common to find in perfectly healthy individuals corpuscles as small as 4μ, and others as large as 9μ.

Recently Hayem† has stated that he finds the average to be between 7·2μ and 7·8μ. He describes them as the great, the medium, and the small. The great have a diameter of 8·5μ; the very great, 8·8μ. The medium are 7·5μ in diameter; the small, 6·5μ; and the very small in normal blood, 6μ. In 100 globules he finds as follows:—75 median, 12·5 great, and 12·5 small. All smaller than these he calls "dwarf," and those above 9·5μ "giant" corpuscles. I believe, however, that it is scarcely correct to hold such a standard, as between meals there is to be noticed a distinct variation in the aggregate size, the minimum occurring soon after a meal, while the maximum occurs at the end of a period of fasting. I have also observed that they are diminished in size at the termination of the period of acute fever after an exanthem, while they attain their maximum during the height of the feverish stage. They are not only relatively but absolutely small in septic conditions after such condition has lasted for some time.

* Mosso (A.), "Die Unwandlung d. rothen Blutkörperchen in Leukocyten u. die Nekrobiose," &c., *Virchow's Archiv path. Anat. u. Phys.*, Bd. cix.

† Hayem (G.), *Du Sang*, Paris, 1889.

They are considered by certain authorities to be devoid of any investing membrane; but I am very much inclined to take an opposite view as the result of observation, first, of the effect upon them of reagents, and secondly, from the observation of their development. If one places some blood in hydrocele fluid of such a density that the hæmoglobin of the corpuscles is not at once discharged, it will be noted that after some little time they assume a cupped form, and it may be frequently noticed that this is associated with the production of a dark-coloured spot, which almost simulates a nucleus. This spot will be found to occupy what one might consider as the hollow of the cup; but attentive observation will show that, with the production of this dark-coloured spot, the remainder of the body of the corpuscle has appreciably lost colour, and on careful focussing it may be noticed that this red material is lying outside the body proper of the corpuscle, and only prevented at this stage from diffusing into the surrounding liquid by the fact of its being withheld by the presence of a very delicate membrane. This is best made out if one examines such a corpuscle when it is lying on its side, with the red-coloured spot occupying an eccentric position; then, on focussing down from the one edge to the other, the fine membrane may be seen and followed, stretching across the cup, as it were, from one side to the other. If this is a veritable membrane, however, it would seem that it is formed merely by a condensation of the stroma of the corpuscle, as it breaks down like it, but takes an appreciably longer time to do so.

The corpuscles are liable to considerable changes of form under the action of reagents. Apart from the "crenation" which occurs as the result of the addition to blood of a fluid of greater density—such as a strong saline solution—there may frequently be seen in freshly drawn blood certain of the corpuscles which have assumed a spinous form; this has been considered as a condition due to an active contraction of the stroma. I have frequently seen such a change followed by a flattening of the corpuscle, and it would seem to be a condition analogous to rigor mortis, as it comes on under conditions of death, and, like it, passes off after a time, leaving the globule in a hyperflaccid state. The same state may be produced, as is well known, by the discharge of a Leyden jar through them. In both cases the corpuscles, after this condition has been reached, tend to adhere and subsequently to fuse together.

That this condition is not always due to an osmotic change is clearly proved by the following observation: — I had

added to a drop of fresh blood an equal volume of a $\frac{1}{50}$ per cent. solution of dahlia in ordinary water. At once, upon adding this to it, almost all the red corpuscles suffered a sudden swelling, followed as usual by diffusion of their hæmoglobin; but some corpuscles are always found in such a case to withstand the aqueous action for many hours, and in this case I noticed, when examining the blood six hours later, that several of those which still possessed some colour were in this crenated condition. Moreover, Hayem has observed in the blood of young embryos certain of the nucleated red corpuscles which evinced a distinct contractility of their protoplasm.*

White Corpuscles.—These bodies, as seen in human blood, are few in number as contrasted with the red corpuscles.

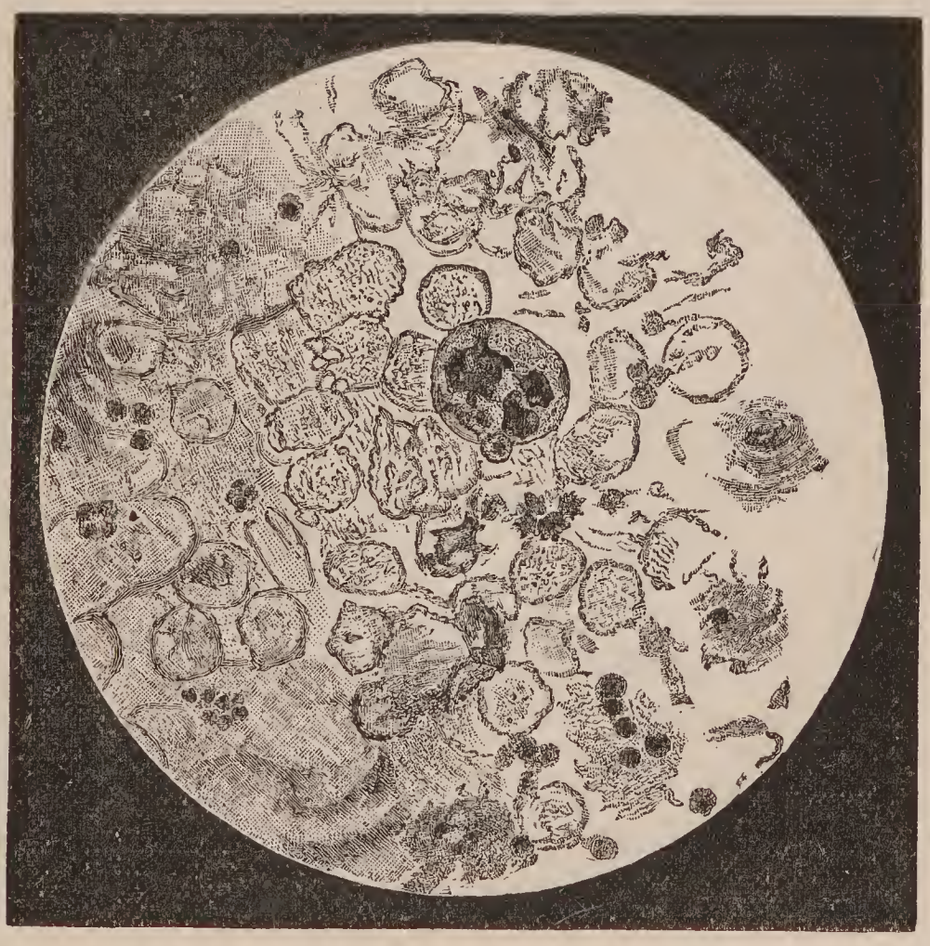

Fig. 1.—From a microphotograph of a preparation stained with methyl violet. There is to be seen a multinucleated white corpuscle, and scattered over the field numerous albocytes, more or less changed by the use of the aqueous solution.

They have been for a considerable period of time regarded as simple protoplasts,† but recently it has been asserted that they possess a distinct cell-wall.‡ Max Schultze, and

* Hayem (G.), *Du Sang*, 1889.

† 'Quain's Anatomy,' 9th ed.; 'Landois and Stirling's Physiology,' 1889.

‡ Hayem (G.), *Du Sang*, 1889; 'Professor Rutherford's Lectures,' 1889.

more recently Hayem,* described three forms in human blood:—1. The smallest spherical forms, always smaller than the average red corpuscle, having one or two nuclei and very little protoplasm, in diameter 6μ to $7{\cdot}5\mu$, and being not at all amœboid. 2. Forms about the size of an ordinary red corpuscle, possessing a variable amount of finely granular protoplasm and an irregularly formed nucleus. 3. Larger forms, in size 10μ or more, and having very granular perinuclear protoplasm. These two latter forms are distinctly amœboid. In addition, however, to the foregoing, Hayem has pointed out sub-varieties:—(1) one which he considers belonging to the first variety, rare in human blood, having a very granular protoplasm, which is sometimes lightly charged with hæmoglobin; (2) a form described by

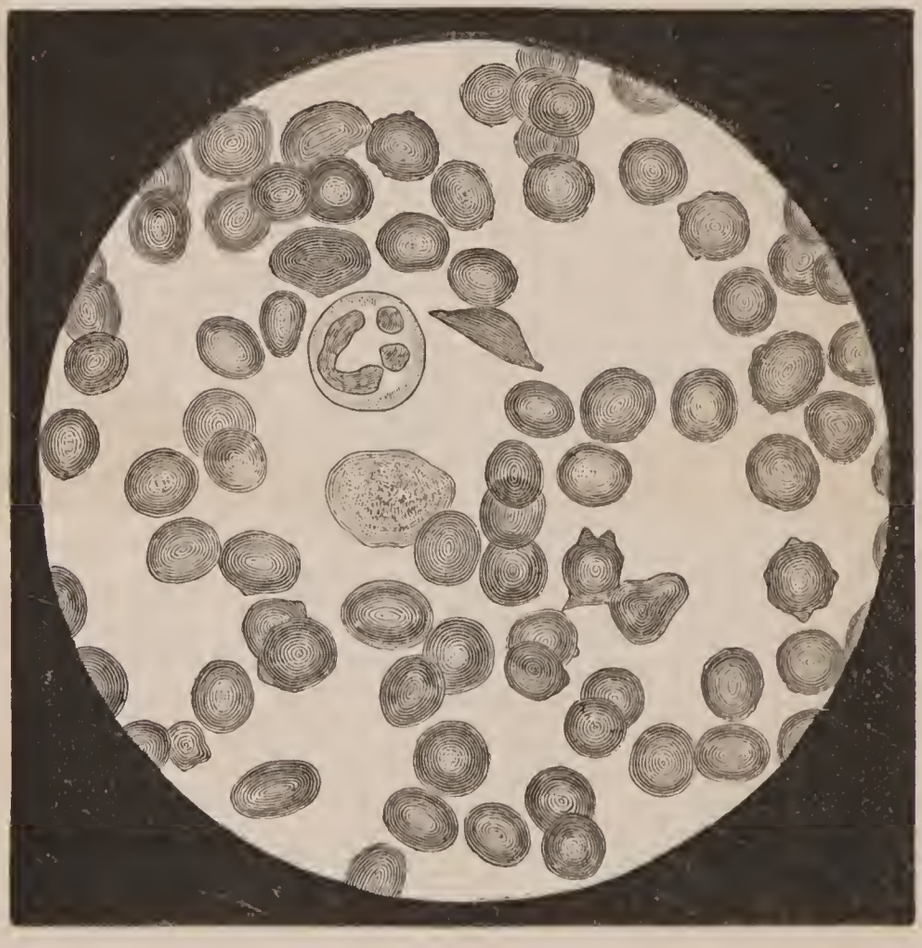

FIG. 2.—Another dried film preparation, similarly stained. In the centre is seen a white corpuscle with several nuclei and a matricyte.

Max Schultze,† smaller in size than the large amœboid forms, but possessing very fine protoplasm. With regard to the development of the white corpuscles, no very definite statements are usually made; and such, for the most part, are to the effect that we are indebted for their origin to gland-cells, as it has been shown that the efferent vessels of

* Hayem (G.), *Du Sang*, 1889.

† Max Schultze, *Arch. f. Anat.*, 1865.

such glands contain the white cells in greater abundance than the afferent. I have to ask, however, if this is the only method of origin, or the most important. In order to answer this, I will first describe the observations which I have made on the morphology and mode of origin of these

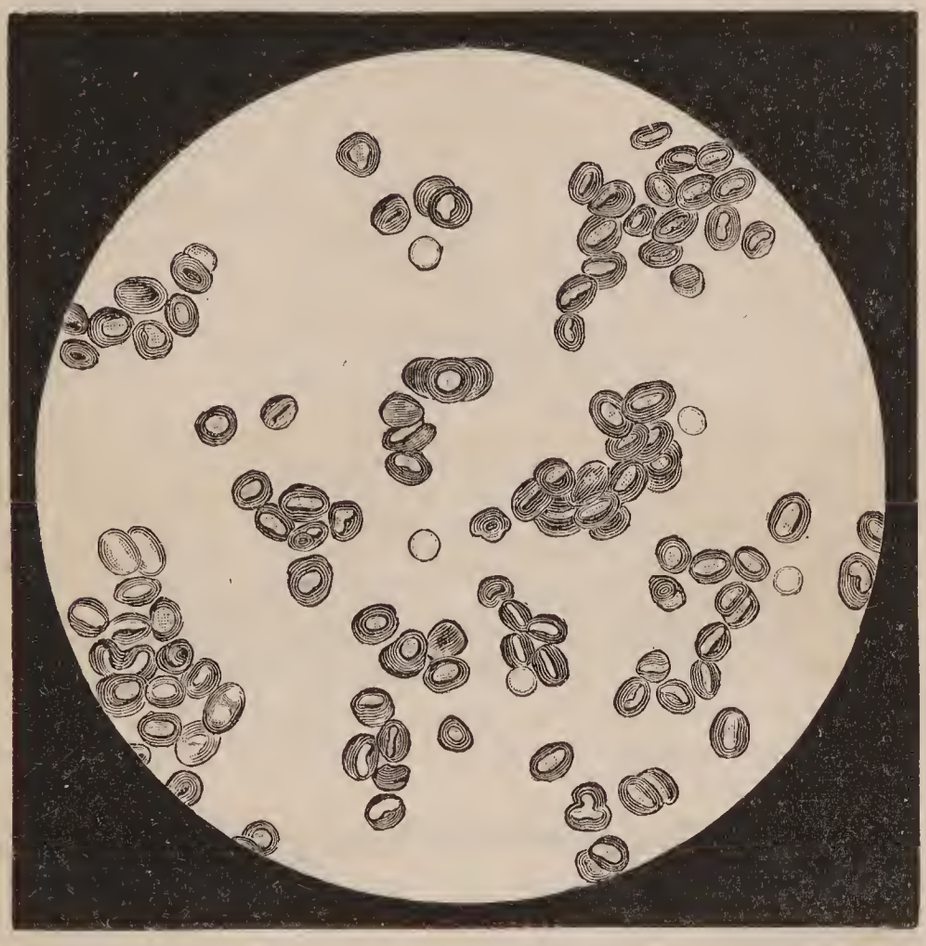

FIG. 3.—A preparation made by the simple sealed cover method, in which may be seen several albocytes which have been photographed, purposely slightly out of focus.

corpuscles. Very little information is to be gleaned from the study of these bodies in fresh blood. Under such conditions they are seen as simple grey translucent bodies, having a varying granularity of structure, and it is not always easy even to detect the presence of a nucleus unless the stage is warm or the blood is kept on the slide for an hour or more before making observations. After some little time they usually spread themselves out, and then, if the illumination is carefully attended to, one may see, at least in the less granular kinds, either one or more nuclei. In order to learn more of their structure one is compelled to make use of some method by which they may be stained. Of all staining agents the aniline dyes will be found most serviceable for this purpose, and of these I have found dahlia, fuchsin, methyl violet, methyl blue, and safranin the most useful. One may examine blood either in dried

FIG. 4.—Another preparation made by the simple sealed cover method. To the left, in the upper part, a small group of alboeytes are plainly visible, as photographed.

FIG. 5.—A dried film preparation, stained with methyl violet. In it is to be seen a matrieyte in the act of rupturing to set free the alboeytes, as photographed.

films on cover-glasses, or may add to fresh blood some indifferent more or less preservative fluid. After a considerable amount of experimentation I have come to the conclusion that no method known is entirely free from objection; and therefore, in order to arrive at any satisfactory explanation of what one sees in blood, it is necessary to make use of a very great number of methods, in order thus to better eliminate all chances of fallacy. The methods which I now mostly make use of by preference are three in number,

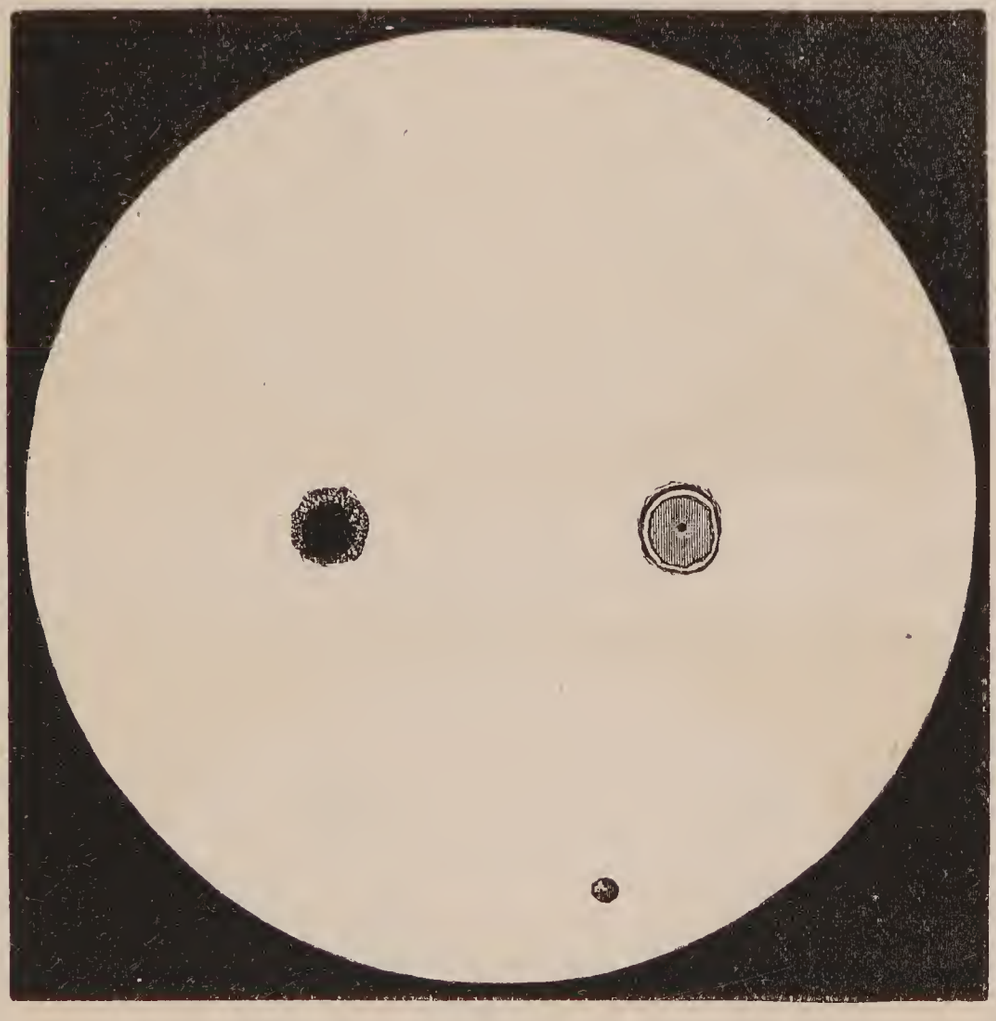

FIG. 6.—A wet preparation, stained with dahlia, and photographed to show the difference between the matricyte and the uninuclear white corpuscles. One of each is seen in the same field.

namely, 1, the sealed cover method; 2, the dried film method; and 3, the wet method. The sealed cover method is as follows:—A very small drop of blood is drawn from a finger which has been previously well cleaned with absolute alcohol. By means, then, of a lance-pointed needle, a puncture is to be made, and, on a drop issuing, it is to be directly, with as great a rapidity as possible, transferred to a clean cover-glass, which is at once turned over on to an equally clean slide. As soon as this has been done, it is to be sealed

by passing around its edge a brush carrying a sufficiency of Canada balsam, when the slide is ready for immediate and prolonged examination. The best results in this way are obtained when the drop of blood is so small that it, by capillary attraction, is just able to reach to the edges of the cover-glass. The subsequent microscopic examination will soon show whether one has succeeded or not, as, if rouleaux are freely forming, it is evident that too large a drop of blood has been used. The formation of rouleaux does not of itself absolutely preclude the possibility of observing certain elements of the blood, but it always indicates that a con-

Fig. 7.—A preparation by the simple sealed cover method, in which a few albocytes are seen.

Fig. 8.—A similar preparation, but in which there are in addition a group of hæmatoblasts present.

siderably thick film has been used, and, as I shall also show, to a considerable extent hinders certain observations. The second method is a well-known one, now that the

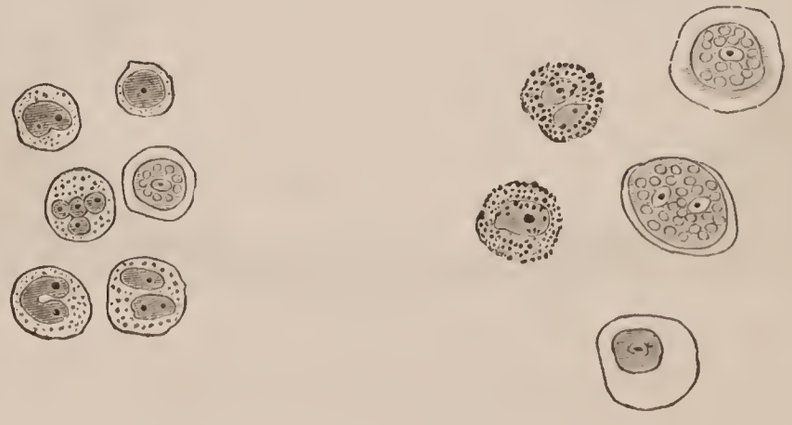

Fig. 9.—A preparation by the wet method, in which there may be seen one matricyte and several white corpuscles, the latter of which are seen in various stages of division, and in all nucleoli are observed.

Fig. 10.—A similar preparation, showing the effect produced after two days' staining by the wet method, on two granular white corpuscles and three matricytes.

examination of sputa, &c., for bacteria is so much undertaken by the practitioner. It is carried out as follows:—Two cover-glasses are made scrupulously clean, and on to one of them a drop of blood is received, when the other is

immediately superimposed, and, on the film having spread to the edge of the covers, the one is at once, with one steady sliding movement, pulled from off the other. In making use of this method it is well to note that no pressure should be applied to the covers, the film being made by capillary attraction only. If more pressure than this be given to the film, there is a grave possibility of certain elements being severely altered, if not, indeed, utterly destroyed. Hayem* makes use of a smoother, in the form of a rod which is passed over the drop, in order to make a thin film; but I question if this is satisfactory, as there is always a possibility of too much pressure being thus applied. After having got the film made, it is without loss of time to be dried, and in practice one finds that this is best done by holding the cover about a foot above a Bunsen burner. After being dried it is to be transferred to the staining agent. Here one has the alternative of using either an aqueous or alcoholic solution of the stain. I usually float one of the cover-glasses in an aqueous, and the other in a saturated alcoholic, solution of the same stain, by which means one is enabled to discount the aqueous action on the one hand, and the alcoholic on the other. If an aqueous stain is employed, the formula which I make use of is—Take of any one of the following stains: fuchsin, dahlia, safranin, methyl violet, or methyl blue, 2 grammes; absolute alcohol, 20 cubic centimetres; distilled water, 100 cubic centimetres.

If an alcoholic stain is wanted, it is prepared by adding a quantity of the stain to some absolute alcohol, and letting it stand several days, during which time it is repeatedly shaken, care being taken to see that more stain has been added to the alcohol than it can dissolve. All stains should be carefully filtered at the moment of being used; and while the film is staining, the dish in which it is placed, which should only have a capacity of one fluid drachm, must be carefully protected from dust, and, what is of still more importance, from possible oxidation of the stain, by a piece of glass which has been accurately adjusted to cover it.

After the film has been stained—which in the case of aqueous stains occupies a period of three to five minutes, while in the case of the alcoholic the film may be left in the stain from one to five minutes, dependent on what one wishes to observe—the cover-glass is lifted out and carefully and fully washed in filtered water until no more stain is seen to flow away from it, when it is left to stand on its edge on a piece of bibulous paper until it is completely dry.

* Hayem (G.), *Du Sang*, 1889.

After this one holds the cover at a considerable distance above a Bunsen flame, just to insure absolute dryness, when the film side is turned over upon a small drop of xylol Canada balsam, laid on a slide, and the film is then ready for observation.

In the case of the wet method, a small drop of blood is placed on a slide, to which is then added an equal amount of a certain staining mixture, a cover-glass applied and sealed with Canada balsam in the same manner as in the sealed cover method.

The stains which I have used for this are as follows:

1. *Dahlia Stain.*—This is simply an aqueous stain made by the formula previously detailed, but diluted to $\frac{1}{100}$ of its strength by the addition to it of ordinary tap water. It is well to keep it for some time, and to filter it carefully before use.

By the use of the dried-film method one learns very much more of the corpuscular nature of blood than might be expected. One notices that the condition of the nucleus in the white corpuscle is subject to exceeding great variation. In normal blood the nuclei vary in number with a characteristic regularity proportionate to the condition of the perinuclear protoplasm from one to four; more are frequently to be seen, but I consider them as variations from the normal.

The first to which notice may be directed is that one in which we may readily discern a single comparatively large nucleus of a spherical form, surrounded with a zone of perinuclear protoplasm. Next there is that in which the nucleus is somewhat larger, and of an oval form, while the surrounding protoplasm is somewhat larger in amount than the preceding form. In another we may observe that the nucleus is somewhat kidney-shaped. Another shows the nucleus as if about to become bent upon itself, while in still another we find that the nucleus is really bent upon itself, forming in this way a somewhat horseshoe-like form. Looking still further we notice some in which the single horseshoe form presents the appearance as if the nucleus was about to divide just at the centre of the horseshoe. These complete the forms assumed by the single nucleus. We have now to deal with those in which two nuclei are present. The first is that in which the two nuclei are close together, arranged in a somewhat horseshoe-like form, and in some cases actually showing a slender bond of connection. In another we find the nuclei somewhat larger, and almost spherical. Next we notice those in which the two nuclei are becoming somewhat oval. Then we may see others in

which the nuclei are each becoming somewhat constricted at their centres. These complete the binuclear forms. Now

FIG. 11.—A semidiagrammatic scheme, representing the development of the blood-corpuscles. *a*. A free daughter nucleus, becoming converted into a matricyte. *b*. Free daughter nuclei, developing again into white corpuscles. *c*. Albocytes.

those with three nuclei may be considered; and we notice that in those, as a rule, while two of the nuclei are small

and spherical, the other is like one of the last binuclear forms we have considered, namely, constricted in the hour-glass-like form. We now come to those in which four nuclei are to be seen, and here the first that I shall draw attention to is that in which the four nuclei are arranged in sets of two, each set of which has a somewhat hour-glass-like form, the two bulbs of the hour-glass being the nuclei, which are still connected by a few stained threads. In other words, we may sum up these observations by saying that we have seen that from the first form, namely, that which consists of a single nucleus surrounded by a fine zone of perinuclear protoplasm, all the other forms are derived by a characteristic regular method of division. (See Fig. 11.)

Structure of the Nucleus.—As made out by staining with aqueous fuchsin, or, still better, by aqueous methyl blue, we note that it is enclosed within a definite nuclear membrane, consisting of a chromatic substance. This membrane is extensile, and presents a considerable opposition to aqueous action; and in a film which is coagulating it is one of the last structures to break down, even lasting longer than the contents of the nuclei itself. Further ascertained in this way, the membrane and nucleus of uninuclear white corpuscle is the most resistent. Within the nucleus we may observe, by means of the same staining agents, a somewhat reticular structure, which, in the case of those stained blue, may well be compared to a fine blue-stained net, enclosing what looks like clear unstained spherical or oval bodies. The nuclear membrane is readily stainable by the stains which have been mentioned. It is stained very deeply by the methyl violet and dahlia, less deeply by fuchsin, safranin, and methylene blue. When treated by the wet method, using either the compound blue, of which the formula will be afterwards stated, or the dahlia stain, we are able easily to see that each nucleus contains within it a well-defined, small, deeply staining body, which, I have no doubt, is the nucleolus. This body seems, in certain of the corpuscles which I shall immediately describe, to contain within itself another body, which may be an endo-nucleolus. The position of the nucleolus is in most cases an eccentric one, but the endo-nucleolus, when observable within the nucleolus, is usually central.

The perinuclear protoplasm differs, as has been stated by numerous observers, in granularity. It is, as a rule, finely granular or almost homogeneous in the uninuclear forms, but from this stage onward it becomes progressively more so. There are to be seen some which possess this granularity in

a very high degree, and have been already noticed by Ehrlich and later by Hayem. The granules of this latter variety have little affinity for either iodine or rosaniline. As they do not take on the osmic acid reaction, they cannot be deemed to consist of fat. The former authority has shown that they have a particular affinity for eosin, but while this is so Hayem shows that they cannot be held to consist of hæmoglobin, as they are not dissolved by such liquids as dissolve hæmoglobin. I have, however, observed that they have an affinity for hæmoglobin. This may be easily seen if one prepares a slide by the sealed-cover method and leaves it to stand for some little time, when, on some of the hæmoglobin of the red corpuscles becoming diffused, it may be noticed that these granules take on a decided yellow tint. Hayem considers them as melaniferous, but I am not certain that he is justified in so doing.

What is the meaning of this division of the nuclei of the white corpuscles? It has been asserted by numerous authorities that it is a degenerative or necrobiotic change, but the characteristic regularity of the process is evidence sufficient against this. As is well known, this phenomenon in other cells is followed by division of the cell itself. Such a process has been looked for here, but the only statement of an affirmative kind is by Klein.* I have myself endeavoured to find some evidence that might justify me in making such a statement, but have never seen it. I would even go further now and say that such a phenomenon in the white corpuscles of man does not occur at all.

The primary lymphatic corpuscle may be looked upon as a cell which possesses a large nucleus, relatively to its surrounding protoplasm. If, then, the origin of the white cells is to be ascribed to the glands, how are we to account for the several nuclei which are to be so easily demonstrated within many of them? If such a condition has arisen by a division of the primary nuclei, are we to consider it as evidence of progressive growth, or to hold with those who say that it is a condition of retrogressive metamorphosis associated with degenerative change. Loscher and Lambl† say that many of the white corpuscles undergo fatty degeneration and perish in the blood, others divide soon after reaching the general circulation, and that this division proceeds from the nucleus. In other cells they say that the nuclei may be observed to be getting smaller and to gradually disappear. They further conclude that a considerable portion of the white

* 'Quain's Anatomy,' 9th ed., vol. ii, p. 32.

† Loscher and Lambl, rev. in *Med. Times and Gazette*, 1861.

corpuscles circulating in the blood are to be looked upon as simple cells without any use, "a sort of rubbish or superfluous ingredient" which it is to the benefit of the system to be as quickly rid of as possible. Wharton Jones considered that the multinucleated condition was due to the action of reagents.*

The first hint which I obtained as to the true condition of the case was from observations made with the dried film method. From this I learned that one is able to detect certain changes occurring in the perinuclear protoplasm of the white corpuscles, which progress coincidently with the division of the nuclei. I have observed that in the uninuclear cells the protoplasm is small in amount, but that it increases with the number of nuclei which are formed. When, however, the full number of nuclei have been formed, it is noticeable that the protoplasms begin to stain less readily, as if indeed it were becoming dissipated.

Further observation has shown me that this is the correct view, as I am able to find free nuclei in the blood as observed by the same method, so that I have concluded that the life-history of the white corpuscles begins with the uninuclear condition from which by successive stages it arrives at that of the multinucleated cell. When this stage has been reached, the nuclei are set free by the protoplasm being used up or otherwise dispersed, and the nuclei are in a condition to act their parts as uninuclear cells. From this view it is evident that white corpuscles may be reproduced from pre-existing cells within the general circulation. We shall see later that the white corpuscles have a much greater and much more important function than even this to perform. I shall, however, at this stage leave the white cells to pass to the consideration of another element which has been described as one of the constituents of the blood, namely, those which have been variously denominated as "blood-plates," "hæmatoblasts," "elementary corpuscles," "globulins," &c.

There exists in the blood a great quantity of granular material, the separate granules of which vary considerably in size. Conne,† in 1842, described such under the name of "globulins," and considered them as the material of which the white corpuscles were formed. The method used by him for their demonstration ‡ consisted in treating the blood with

* Wharton Jones, *Phil. Trans.*, 1846.

† Donne, "De l'Origine des Glob. du Sang," *Comptes Rendus*, 1842.

‡ Donne, *Cours de Microscopie*, Paris, 1844.

water. In 1847, Zimmerman* described under the name of "elementary granules" certain small bodies about 1μ in size, which he considered to be normally present in the blood. According to Hayem, his methods consisted in defibrinating the blood and then treating it with water, or in letting the blood coagulate, and subsequently examining the serum which issued from it. He believed that the small bodies which he thus saw, by progressive increase in size, ultimately became red corpuscles. M. Ranvier in 1873 published a statement to the effect that they were in all probability small fibrinous grains. Max Schultze † later more minutely described what are in all probability the same bodies, occurring in the blood of young and old in the form of small masses of colourless particles of unequal dimensions, occasionally seen separate but more frequently united into groups, with irregularly defined edges, and within which the separate elements were held together by means of an interstitial finely granular substance. He described the single elements themselves as colourless, homogeneous or finely granular, and but little refractile. They did not appear to be symmetrically formed, being sometimes angular, and when so having a more granular aspect and a sharper outline. After some little time they began to break down and dissolve into fine granulations of different sizes. More recently similar bodies have been noticed by Riess, Vulpian, and Ranvier, and still later Hayem has redescribed them under the name of "hæmatoblasts." ‡

The last observer describes them as being extremely "vulnerable," and states that for this reason it is necessary to observe them just at the moment of their issuing from the blood. He directs that cover-glasses and slides should be carefully cleaned with alcohol or ether and left to dry, when four small drops of paraffin are to be placed upon the side in such a manner that they may act as little feet to support the cover-glass, and keep a small, almost capillary, space between it and the slide. Then on a puncture being made of the finger, the blood is so to be received upon the slide that it runs in by capillary attraction under the cover-glass. He then states that a high (?) magnification is to be used, namely, a 2 or 3 ocular and 7 objective of Nachet. The blood-corpuscles will be seen rushing about, and among them will be noticed "very small corpuscles resembling small red globules, very delicate and

* *Rust's Mag. f. d. gesam. Heilk.*, Bd. lxvi, Heft 2, 1846.
† Max Schultze, loc. cit.
‡ Hayem (G.), *Du Sang*, 1889.

pale. Immediately on being perceived, they begin to change there ; they become spinous, adhere to the cover-glass, bend themselves, become pale through losing a part of their substance, and have a tendency to adhere to corpuscles, which they encounter in such a manner as to form a mass. Sometimes they arrest the passage of one or two red corpuscles which adhere by some point of their periphery, whilst the current seeks to drag them on, taking immediately a pear-like form. After some little time the red corpuscles disengage themselves in order to form rouleaux, and the small elements in question remain isolated, or form chaplets or masses. By this time they have become profoundly altered and almost irrecognisable, but one has been able to observe their presence, follow their transformations, and to convince oneself that in addition to the red and white corpuscles the blood contains other peculiar corpuscles which alter themselves very rapidly." Hayem believes these bodies to be the germs of the red corpuscles, and to become such by successive stages.

Bizzozero has in a similar way referred to these bodies, and while he cannot hold with Hayem that they are the embryonic forms of red blood-corpuscles, he considers them as the agents which directly excite fibrin formation. Eberth and Schimmelbusch believe that the formation of white thrombi are due to them. In 1878, Norris* described what he styled the invisible or colourless corpuscle, which he later detailed in a work on the physiology and pathology of the blood. The bodies which he drew attention to were, however, later shown by Mrs. Ernest Hart† to be simply red corpuscles which had been by the author's method deprived of their hæmoglobin.

I have thus fully referred to these various descriptions in order that they may not be confounded with the new blood-corpuscles which I am about to describe.

A New Blood-corpuscle.—There are to be observed in normal blood certain peculiar corpuscles which are undoubtedly the young forms of the ordinary red corpuscle. In order that they may be distinctly seen it is necessary that a good optical combination be made use of. For this purpose I have been in the habit of selecting Zeiss's E objective with a 3 or 4 ocular, but for the most accurate delineation of them the 2 mm. apochromatic objective (oil immersion) with the 4 or 8 compensation eye-piece is preferable. It is also well to use an Abbé's illuminator, or preferably an

* Norris, 'The Physiology and Pathology of the Blood,' 1882.

† *London Medical Record*, January 15th, 1880, and October 15th, 1882.

achromatic condensing system (Zeiss's). In using either of the latter a diaphragm of about $\frac{1}{4}$ inch diameter and one of $\frac{1}{2}$ inch should be used, but until the observer has accustomed himself to seeing them it is better to use a smaller diaphragm ($\frac{1}{8}$ inch diameter). The method of preparing the blood is most simple; it is that which has before been described as the simple sealed cover method. The principal thing to be attended to is to see that a very thin film of the blood is being used. At first, when observation has begun, they may not be easily seen, as their refractive index is almost identical with that of the serum in which they float; but after a little time they appear as small, very delicate, beautifully spherical corpuscles, measuring in size from 1μ to 4μ, the average being about one third the diameter of a red blood-corpuscle. Little by little their outlines become more apparent, until at the end of twelve hours they are sharply defined. It is necessary to point out that it requires very delicate focussing, and the use of some form of mechanical stage is of the very greatest service. When out of focus they appear as badly defined grey spheres, of which it is not possible easily to define the contours, but when sharply in focus their areas are clearer than that of the surrounding field. They have nothing whatever to do with the fibrin formation, and do not at all tend to dissolve as the hæmatoblasts of Hayem are said to do. In a slide so prepared they may be seen even after the lapse of a week if the sealing of balsam has been so complete as to prevent the blood from drying up. After two or three days, nevertheless, one observes that these corpuscles, when grouped together in close contact, suffer individually from mutual pressure, just as the red blood-corpuscles do when they have been kept for some little time. If one adds to the blood hydrocele fluid, of which the density has been a little lowered, and which has had added to it some methylene blue stain, it is often possible to see that they suffer from osmotic change, just as the red cells do. In such a case, after they have become somewhat swollen by the absorption of the fluid, it may be seen that suddenly the contained material is, as it were, torn from its connection with the periphery of the cell, and becomes retracted to one or other side, and then takes on to a slight extent a blue staining, tending to show that there is a definite stroma, which is closely connected with the investing membrane. In making such observations I have been struck with the fact that where rouleaux of red cells are prevented from forming by the thinness of the film, little or no fibrin threads form. I must, however, emphasise that

even in cases where fibrin is formed these small corpuscles are yet to be seen, and, as far as it is possible to see, they are in no wise affected by its formation. They may even be obtained from blood which has coagulated in thick films. The use of saline solutions tends to utterly destroy them, but in films which have been dried and stained it is quite possible to see their remains, which appear as somewhat circular slightly irregular rings with a somewhat ragged interior; in fact, they are acted upon very much as are the red blood-corpuscles themselves. Of all the blood-corpuscles the smallest red are, as a rule, those which are the most tenacious of form and other natural characteristics when removed from the circulation, and these corpuscles are equally if indeed not more so. It is possible to see that the larger of them are distinctly discoid, and one can follow easily their transition up to the condition of the true red blood-corpuscle. I therefore hold that the red blood-corpuscles of man are developed from smaller cells, which are at first colourless, and, as far as I perceive, spherical, but which by progressive increase in size, and by the acquirement of hæmoglobin, become fully developed red cells. As it is clear that the terms "blood-plates" and "hæmatoblasts" are inapplicable to them, I would suggest for them the name of *albocytes*, from the fact that they are in their pristine condition colourless.

The Origin of these Small Blood-corpuscles.—When one examines dried films of blood which have been stained, it is curious to note that these cells are often found arranged in more or less spherical groups, and I therefore thought that it was most probable that they were developed within some cell which, by its rupture, gave rise to the corpuscles and this peculiar arrangement of them. I endeavoured for a very long time unsuccessfully to find such a hypothetical cell, until the examination of an immense number of slides gave me at last the cell of which I was in search. I have since seen several of them, but the one from which Fig. 5 is photographed is by far the best demonstration of the act of parturition. It will be noticed that the central part of this cell is occupied by a dark stained spot, which for some time puzzled me, but which is now, however, fully explicable and most easily demonstrated. If one wishes to see this cell it is best to make use of the wet staining method, and to use either the $\frac{1}{50}$ per cent. dahlia stain, or the following compound blue stain: 2 per cent. aqueous methyl-blue solution 2 cc.; distilled, 5 cc.; 2 per cent. aqueous methyl-violet solution, 1 cc.; distilled water, 50 cc. If a drop of this

solution be added to an equal volume of blood on a slide, which is then sealed with Canada balsam, and subsequently examined, it will be seen that the white corpuscles gradually become deeply stained by it, and as they are staining, it will be easy to see that each of the nucleoli, of which there is one present in each resting nucleus, divides into two before division of the nucleus itself occurs; but it will also be noticed that gradually another cell is coming into view as its nucleus acquires a faint blue colour, contrasting with the deep violet colour that the nuclei of the white corpuscles take on.

I should here note that the colour reactions, both of the dahlia stain, as also that of compound blue stain, are very much similar, but of the two I prefer the compound stain for the demonstration of the cell to which I most desire here particularly to allude.

The slide should be allowed to stand for a period of twelve hours in order that the cells may be permitted to stain fully, but they may be seen in a few minutes after the stain has been added to them. The uninuclear white corpuscles take on the stain very deeply, and a narrow zone of protoplasm may be seen to surround them; after a time, however, this zone presents a very ragged outline, and ultimately it may entirely break down and disappear. This serves, in a great measure, to distinguish them from the new cells. These latter cells possess a very large nucleus, which is surrounded with a very sharply defined thin zone of protoplasm enveloped in a distinct membrane, which remains almost intact for a very long time indeed. The nucleus stains faintly; in its central part there may be noticed a clear oat-shaped body fairly defined, within which there is situated absolutely centrally a smaller, dark-stained point, the body previously alluded to as occurring in the cell seen in the dried film.

In all probability this small dark-stained body is not a nucleolus, but an endo-nucleolus, the nucleolus being the clearer oat-shaped area which encloses it. Within the nucleus, and surrounding the nucleolus, there may be seen a considerable number of clear, ill-defined, small spherical bodies, the young albocytes, which become liberated in the blood under conditions which we at the present time have no means of knowing. As these cells may be looked upon as mother cells, I propose for them the term of *matricytes*. With regard to the period of rupture, I have noticed that there are very few albocytes to be seen in the blood during a period of fasting, but they are very soon seen after a meal

has been taken. I have recently devised an experiment to show that the albocytes are really produced by the rupture of certain cells containing them. If one draws blood from the finger, and immediately brings it in contact with a cover-glass in such a manner that the drop of blood suffers no compression from the finger or glass, and if the finger carrying the drop be then moved all over the surface of the glass, a somewhat thick film of blood will be deposited thereon. This must be done so rapidly that the blood is prevented from drying, and the cover-glass is then to be deposited film side uppermost in a small glass dish, which can be firmly closed by a glass cover. Within this glass dish there should be previously placed a small piece of moistened blotting-paper, in order that the film may be kept in as nearly as possible a natural condition of moisture. This dish then should, with its contained film, be placed in an incubator, and kept at a temperature of 35° C. for one or two days, after which it is to be taken out, dried, and then stained with an aqueous 2 per cent. solution of methyl blue, after which it is to be washed, dried, and mounted on a slide with Canada balsam. At the same time as this blood was prepared, another drop should have been taken, which should have been dried and stained at once for purposes of control.

In the immediately prepared film one may notice but few albocytes, and not a great deal of granular material, but on examining the film which has been incubated, one will be struck with the number of albocytes, and there will be observed considerable numbers of empty envelopes, from which it is evident that they have emerged. In films of blood simply sealed with balsam the albocytes may be distinguished from the granular matter of the blood by the fact that the granules of the latter possess a peculiar greenish, refractile appearance, while this is not at all apparent in the case of albocytes. It is well, however, to note that the granular matter is very frequently to be seen beside them. So much is this sometimes the case that at one time I was not clear that they were not developed in some way from it. I, however, was entirely able to disprove this by placing slides under the microscope, and, by careful and prolonged watching, observing that they frequently appeared in spaces where there was no granular material present whatever.

The granular material of the blood seems to be of two kinds, one of which, probably the hæmatoblasts of Hayem, is quite evidently associated with fibrin formation, and which tends to break down in the way Hayem describes. But

there is another kind which does not so break down, and which takes on such forms that it might easily be mistaken for bacteria or monads. This latter kind of granules I have observed to be extruded from the white corpuscles while they were undergoing amœboid movement. On being liberated they perform gyratory movements, and dance away across the field. They may also be noticed in active movement evidently of a Brownian or molecular kind, even after the lapse of some days. I am convinced that both kinds have the same origin, namely, from the white corpuscles, because if one stains a film of blood which has been for some time coagulated, one may observe that all around the white corpuscles there is to be seen an areola of delicate fibrin filaments, just in the same way as they appear around the hæmatoblasts. So that it is quite right to believe that the white corpuscles are the chief agents in inducing fibrin formation, and of these corpuscles that the granules are the essential cause. The other granules to which I have drawn attention are, I believe, of a similar nature, but being older, and probably undergoing some degenerative change, have lost their power of inducing fibrin formation.

[Our thanks are due to the Editors of the *British Medical Journal* for their kindness in granting the use of the blocks for printing the illustrations.—EDS.]

"PRINCIPALS AND ASSISTANTS."

THE qualified assistant to a general practitioner, especially one in a country district, may continue with much profit his student's career by carefully studying those cases with which he has not hitherto become familiar. Young surgeons will do well to remember that, though great credit undoubtedly attaches to skill in cases of emergency—such as the prompt arrest of profuse hæmorrhage, the speedy relief of a distended bladder, or the rapid and painless removal of a foreign body, much greater credit attaches to the patient and kind treatment throughout of a chronic ailment, lasting it may be for months. It requires much time and constant practice to acquire the patience, with perfect command of temper, necessary to endure the irksomeness caused by these monotonous duties, and the sooner young practitioners begin to learn them the better.

Assistantships are not so popular among the younger

members of the profession as could be wished, this being due to various causes. Principals do not sufficiently recognise that in these days it is unreasonable to expect a qualified assistant to dispense medicines; where one is required a dispenser should also be kept. The qualified assistant of to-day has often spent years in study of a much more advanced kind than that of the generation to which his principal probably belongs, and a little mutual concession may make the former of great value to his employer quite beyond the assistance afforded to him in his practice by visiting and attending midwifery. He may keep him in touch with modern views and recent researches, which a busy practitioner could hardly acquire without such assistance. The principal of a town or country practice may by generous treatment obtain the services of men quite as efficient as those whom the managers of provincial hospitals and infirmaries secure for their resident appointments. Such men must have passed through their curriculum with credit; they would make very valuable assistants, but they have a right to expect better treatment from their principals than, it must be confessed, they even yet sometimes receive. The term "assistant" is an unfortunate one, and should be replaced by one more descriptive of the fully qualified man and less suggestive of inferiority. A young professional brother who can visit patients, attend obstetric cases, act in the absence of the principal at inquests, in courts of law, and on other occasions, is a valuable friend who ought to be treated with courtesy as well as generosity.

On the other hand, even qualified assistants have not always treated principals with the respect due to their years and experience. Equally young physicians and surgeons must bear in mind that the private, and even club and parish patients of their principal stand upon a totally different footing from hospital patients, and cannot be always dealt with according to similar rules of procedure. We trust that in the foregoing remarks we shall not be misunderstood. We are far from suggesting that all principals are ungenerous or wanting in courtesy. Nor would we have it supposed that we believe the younger members of our profession to be all insubordinate or wanting in respect to their superiors.—*Lancet.*

THE VALUE OF OBJECTIVES.

By "Inquirer."

In the *Veterinarian* of last April, Professor McFadyean is reported to have said, "Any microscope that will magnify 300 or 400 diameters will suffice to show plainly enough for diagnostic purposes the anthrax bacilli and the other germs," &c. In the *Veterinary Journal* of the current month, a Mr. Bowhill, in describing the micro-organisms of Texas fever, says, "I could not define any distinct organisms, as my highest power was only an eighth of an inch."

It would be interesting to know which of these opinions is more valuable. Certainly Mr. Bowhill does not tell us the name of the manufacturers, nor what eye-piece he employed with his objective, which makes a great difference. As so much is said nowadays about the use of "higher powers" in bacteriology, I should like to know if a magnifying power of 700 diameters would not suffice for all practical purposes, supposing that Professor McFadyean's 400 diameters was considered "too low."

Will some of your numerous correspondents kindly answer this question?

ROYAL VETERINARY COLLEGE.

July, 1890.

Fifteenth Annual Report under the Charter of Incorporation, ordered by the Governors of the College to be presented to the Subscribers.

General Government.

Since the last Annual Meeting two vacancies have occurred in the list of Vice-Presidents of the College, caused by the deaths of the late Earl Sydney and Sir James Tyler. Lord Sydney's connection with the College dated from 1832, and Sir James Tyler's from 1843.

A vacancy in the Governing Body has also occurred by the death of the late Sir C. S. Paul Hunter, Bart.

At the Annual Meeting in July, 1889, Lord Portman was elected a Governor and Vice-President of the College, and Lord Stalbridge and Mr. Burdett-Coutts were elected Governors.

There are now ten Vice-Presidents and twenty-six Governors on the list, which allows of the election of two of the former and four of the latter at the approaching Annual General Meeting.

The School.

During the educational year 1889–90, 69 Students have entered the College; the number during the similar period 1888–9, including the Summer Session of 1888, was 82. Students now enter the College at two periods of the year only, viz. October and Christmas. Of the 69 Students who have entered, 27 did so by Matriculation, and 42 by Educational Certificate. Of the 82 who entered in the previous educational year 52 did so by Matriculation and 30 by Certificate. The proportion of Students entering the College by direct examination has during the past few years steadily fallen off.

With a view of introducing a uniform standard of educational fitness the Royal College of Veterinary Surgeons has undertaken the conduct of the Matriculation Examination for the entry of Students to this as well as to the Scotch Veterinary Schools. It is not proposed, however, to make any alteration in the standard of the examination until the year 1891.

In order to meet the increasing severity of the Professional Examinations to which Veterinary Students are subjected the Governors have had under their consideration a more comprehensive scheme of education than has hitherto been attempted. To successfully carry out this scheme it has been found necessary to contemplate a considerable increase in the expenditure for teaching purposes, and also to provide a new Lecture Theatre, Museum, Library and Reading Room, &c., at a heavy cost. To meet the additional outlay necessitated by these improvements the Governors have decided on raising the Educational Fees paid by Students for the three years' course from 45 to 60 Guineas.

The measures adopted, of which mention was made in last year's Report, for getting rid of a class of student known as "chronic," have been, the Governors are pleased to find, eminently successful.

The number of names on the books at the beginning of the Winter Session, October, 1889, was 289; 9 Students joined at Christmas, giving a total of 298.

During the year 47 Students have obtained the Diploma of the Royal College of Veterinary Surgeons, the number last year being 54, and in the previous year 61.

Infirmary and Subscribers.

The daily average of horses in the Infirmary during the past year has been 53, showing a decrease of 2 since 1889, when the number was 55; in 1888 the number was 47.

The average number of dogs has been 10, against 10 last year.

The individual number of cases admitted into the Infirmary for treatment or special examination has been 837, against 905 last year and 861 the year before.

The number of horses examined for soundness has been 1174,

the number during the previous twelve months being 1276, and for 1888, 1202.

The number of animals treated as out-patients has been 1317, against 1636 last year and 1590 the year before.

Two hundred and six new Subscribers have been enrolled during the year, of whom 22 are members of the medical profession, and 12 of the Royal Agricultural Society, who have availed themselves of the privilege of becoming Subscribers at a reduced subscription of One Guinea.

There are at present 112 Life and 872 Annual Subscribers.

Gratuitous Advice.

This department continues in active operation, and its advantages are highly appreciated by the Senior Students, by whom, under the supervision of an officer of the College, it is carried on.

During the year 1572 individual cases have been brought for advice or treatment, and as several of these pay more than one visit the total number of inspections which have taken place amounts to 1852. The numbers last year were 1618 and 2425 respectively.

Buildings.

During the past year the various buildings have been maintained in a state of thorough repair. A most commodious Forge and Shoeing House has been built; and an extensive range of buildings over the Ride, containing a Lecture Theatre, Museum, &c., of which mention has already been made, is now in course of erection.

Finance.

The Governors are pleased to report, as will be seen from the accompanying Statement of Income and Expenditure, an excess of Income amounting to £878 8*s.* 2*d.*

The total Income for the year has been £9987 5*s.* 9*d.*, and the Expenditure £9108 17*s.* 7*d.*; last year the Income was £10,494 10*s.* 2*d.*, and the Expenditure £9559 13*s.* 8*d.*

Royal Agricultural Society.

The Governors have great pleasure in announcing that the Council of the Society have decided to make an Annual Grant of £500 to the College for the purpose of founding a Chair of Comparative Pathology and Bacteriology. The conditions on which this grant is made are—(1) That the College undertake, as before, to investigate any outbreak of disease amongst animals that may be reported by Members, and to defray the expenses of such investigation when considered necessary or advisable; (2) that the existing Veterinary privileges of Members of the Society be continued by the College; and (3) that the Grant may be discontinued by the Society on their giving six months' previous notice. In accepting this generous Grant the Governors have assured the Society that in founding this important

Chair due care will be taken that the Royal Agricultural Society shall be identified with its establishment.

Several important investigations have been undertaken by the College on behalf of Members of the Society.

Among the chief subjects of inquiry may be mentioned an outbreak of parasitic lung disease, of tapeworms in lambs, hydatids on the brain, anthrax, abortion, and a peculiar form of blindness among Jersey cattle.

Scholarship and Coleman Prizes.

The Principal and Professors recommend that the Scholarship be awarded to Mr. F. W. Hunt; the Coleman Silver Medal to Mr. C. B. Harris; the Bronze Medal to Mr. F. E. Place; and the Certificate of Merit to Mr. T. C. Garry.

NIGEL KINGSCOTE,

July 10*th*, 1890. *Chairman of the Governors.*

CENTRAL VETERINARY MEDICAL SOCIETY.

THE usual monthly meeting of the above Society was held at the First Avenue Hotel, on Thursday evening, June 5th (Mr. W. Hunting in the chair).

The *Secretary* said he had received letters from Messrs. Wright and Harry Withers, expressing their regret at not being able to attend. He had also received a post-card from Professor Walley on the subject of printing his essay, "'Tis only a Pin."

The following gentlemen were then balloted for and elected Fellows of the Society:—Mr. Charles J. Humphrey, 58, East Hill, Wandsworth; and Mr. J. A. Gosling, 180, Blackfriars Road, S.E.

The *President* read his paper on "A New Charter—is it Needed?"

GENTLEMEN,—Although subjects of scientific interest are preferred for our meetings, I cannot doubt but that questions affecting the welfare of the profession are also acceptable. No question of greater interest to us all is more to the front than that of the expediency of applying to the Privy Council for a new Charter; whether we be in favour of it or adverse to it, thorough discussion can only tend to enlightenment.

In 1884 our calling was made a profession and our members were made a corporate body by a Royal Charter. The privileges then granted us were accompanied by rules and limitations which regulate our corporate action and strictly bind us to a definite method of procedure. As the profession grew in numbers and importance it was found necessary to modify and alter in various ways some of the provisions of the Charter. In 1876 we obtained a Supplementary Charter. In 1879 we again

obtained another Charter, and in 1883 a fourth Charter was found necessary to enable us to carry on to the greatest advantage the governance and regulation of the profession.

New Charters, then, are no novelty; we have three precedents before us, and it only remains to show that another Charter would be advantageous to demonstrate the necessity and expediency of applying for it. Unless it can be clearly shown that a necessity exists for a new Charter it would be folly to take any steps towards obtaining it, and unless a decided majority of the profession are convinced of that necessity I should admit that it is not expedient.

The argument that it would be expensive will not stand a moment's consideration. We have sufficient funds to pay all the cost without dangerously depleting our treasury, and the only calls upon them are for necessary expenses. If a new Charter be necessary to our welfare as a profession, if it will promote our interests, if it will add to our unity and strength, the pecuniary outlay can only be called a useful and necessary expenditure.

Reasons why a New Charter is required.—I. To amalgamate the existing four into one, and so render the constitution of our profession intelligible to anyone of ordinary mental powers. Even if no other reason could be adduced, this alone would justify us in asking for a new Charter. At present there are probably not three men on our Council who can tell, without reference, how each Charter has modified the others. So complex are our rules that a legal adviser is necessary to help and guide the Council at every proposal. This complexity disgusts practical minds, and results in men not taking the interest they should in the arrangements of our profession. Simplicity and lucidity might be attained in a new Charter.

II. To alter the Charters so as to permit improvements in the government of the profession, and thus enable us to more easily advance with the times.

A systematic study of the Charters would doubtless enable us to improve many of the clauses which now affect the constitution of the profession. It would be very rash to attempt any modifications without the most serious and careful consideration. This work we desire the Council to undertake, but until the profession makes its desire clear and intelligible we cannot, perhaps, blame the Council for treating the matter as not very pressing. Not long since Mr. Kidd moved a resolution that the Council should consider the subject. His resolution was rejected mainly on two objections—that the expense would be great, and that the matter was not urgent.

There are at least three alterations which I think a majority of the profession now consider desirable, and which are quite sufficient to warrant an official inquiry.

1. An alteration of the original Charter which will enable the profession to directly elect every member of the Council.

2. An alteration of the 9th Clause of the 1876 Charter, which will leave the Fellowship "a higher degree," but restore to the members their rights and privileges.

3. The insertion of a clause which will prevent men acting both as Councilmen and examiners.

Vice-Presidents.—The original Charter of 1844 ordains that the concerns of the body corporate shall always be managed by a Council; and that the Council shall consist of not more than thirty-one nor less than twenty-four members, of whom one shall be President and six Vice-Presidents. It further declares that the Council shall be elected at the annual general meeting by the members, but that the President and Vice-Presidents shall be elected by the Council, at a meeting to be held before the expiration of one month after the annual meeting. It provides also that the President and Vice-Presidents shall remain in office till the annual meeting at the end of their year of office breaks up or adjourns.

This last provision was altered by a clause in the Charter of 1883. Under the old regulation we were without President and Vice-Presidents during the time which elapsed between the annual meeting and the meeting of Council at which fresh elections were made. To remedy this inconvenience the 1883 Charter provides that "The President, Vice-Presidents, Treasurer, and Secretary shall continue in office till the meeting of Council at which their successors are appointed, and on the appointment of their respective successors they shall respectively retire from office." By this alteration a possible inconvenience was guarded against, but a greater evil was introduced, viz. the power of each Vice-President attending at the meeting and voting for his own re-election. The votes of six men in a large electoral body are of no importance, but the votes *and interest* of six men in a small body of less than thirty is a power which should not be allowed on a so-called representative body, especially when it is remembered that these votes may be cast for themselves. This can only be altered by a new Charter.

But even under the old rule the arrangements for election of Vice-Presidents were objectionable in two respects, and these are still in force. Of the thirty members of Council there retire annually six Councilmen and six Vice-Presidents. The profession elect the Councilmen, but the Council elect the Vice-Presidents, so that it is always possible for the Council to nullify the effect of the voting of the profession. There is no reason whatever why the Council should have the power of selecting men as Vice-Presidents who have not been elected to the Council by the votes of the profession. A Vice-Presidency is an honorable position—next, in fact, to the Presidency. Men should be chosen for it on account of their special fitness for the duties of the post—*not merely because it enables them to act as a member of Council for a year without the ordeal of election by the*

profession. Perhaps the greatest objection to the existing system was indicated by Sir Henry Simpson at the last Council meeting, when he proposed the election as Vice-President of Professor Axe, who had just terminated his year of office as President. Sir Henry explained that he did so because on any occasion on which, in the absence of the President, his duties were carried out by a Vice-President, it was most important that the deputy should be a man possessing experience of Council matters, and conversant with the duties of the chair. No one is so fit for this as a past President, whereas the present system absolutely limits the Vice-Presidentship to untried and inexperienced men. Instead of our oldest men being selected as Vice-Presidents it is our youngest; instead of the office being looked upon as the highest but one, it is used as a nursery for coming Councilmen. Sir Henry Simpson has indicated a very grave evil, but one which cannot be satisfactorily solved till a new Charter has altered the method of election.

The alteration is a simple one—the profession must elect the whole thirty members of Council, and then the Council can select the best and most suitable men as Vice-Presidents. In this way our Council would be directly representative of the profession. The Vice-Presidency would be a more honorable position, and men who possessed the necessary experience would be elected to it.

That our governing body should be as truly representative as possible; that our Vice-Presidents should be selected for suitability; that every one of our councilmen should be subject to the approval of the members of the profession seem to me such elementary propositions that the simple statement should ensure their acceptance. I think I have shown that not one of these necessary conditions now exists, and that we can only obtain them by a new Charter.

The 9th Clause.—In the Supplementary Charter of 1876 there is a clause which provides that no member of the profession, except those who at that time were members of Council, should, at the expiration of ten years be permitted to act as a member of Council or as an examiner unless he had passed an examination and paid fifteen guineas for the Fellowship degree. The Charter of 1876 was obtained chiefly to establish the Fellowship degree, and the reason stated for the step is "to more effectually promote and encourage the study of veterinary medicine and surgery." Apparently the authors of the Charter had little faith in mere "promotion and encouragement;" they therefore determined that any member who did not take the new degree should be *punished* by being debarred from holding any of the honorary and honorable positions the profession had to offer. It must be confessed that at that time veterinary science was not much valued, that its practitioners nearly all sneered at "science," and generally treated it as something quite opposed to "practice." Some excuse, then, may be made for the Council, who fancied

"the higher degree" would become a dead letter unless some strong inducement were provided to *make* men take it; and the 9th Clause was invented. The clause has conspicuously failed to do what was intended. It has *not* forced men to take the degree, but has raised ill-feeling, and made the large majority of the profession who are members only look upon the small minority who call themselves Fellows with anything but sentiments of respect. The special privileges which are reserved for Fellows have not only injured the recognition of the degree as a scientific advance, but they have positively caused a feeling of opposition, which increases every year, and gives promise of being a strong factor of disruption. No one has said a word against the Fellowship as a mark of honour, and no one would hesitate to accept it as evidence of scientific eminence, provided the obnoxious privileges were separated from it. Even if it be granted that all the Fellows possess scientific attainments above the level of the members, there is no argument for depriving a member of direct participation in the government and guidance of the profession. Scientific attainments are by no means the only requisites for a councilman; but the Fellowship examination makes no attempt to test any other qualifications. Everyone knows that there are scores of members possessed of common sense, business tact, knowledge of the world, experience of men, education, manners, money, and social position, in quite an equal degree to the best representatives of the Fellowship. Everyone knows that such men would make good councilmen, but their powers are now lost to the profession because they do not care to present themselves for examination. Is there any moral right to force a man to pass a scientific examination if he does not wish to? Is there any moral right to deprive a man of the exercise of certain privileges—amongst others of a voice in regulating the profession to which he belongs—simply because he may not possess the theoretical knowledge of a recent student? Is there any test applied to the Fellows to show they possess special fitness to act as councilmen—any test which can compare with the natural and constitutional one of selection by his fellows?

To all these questions there can be only one answer—No.

The fact is the Council in 1876 made a mistake: they imagined the Fellowship degree by itself and on its merits would not be sufficiently attractive, so they added a coercive clause. This clause has injured and obstructed the degree at the same time that it has deprived men of privileges they had a right to. It will always be a stumbling-block. Members will always be numerically greater than Fellows, and will feel hurt that a few should rule them, and take positions from which they are barred. The members will become more and more indifferent as they recognise that they have no part in the regulation and progress of their calling, and professional apathy will increase.

Let the profession recognise that the Council of 1876 did their best and legislated honestly. They were wrong, and there is no

credit in refusing to acknowledge the error. They copied a notion from the College of Surgeons, which even then was the cause of disagreement in the sister profession, and now is a source of constant quarrelling. Their mistake is not irreparable, and the Charter is not unalterable.

It has been said that in 1876 the whole profession knew what the Council were doing, and silently approved. Some more venturesome men have said that each individual member was consulted by circular. Now, I do not wish to assert that these statements are false, but I ask for proof. We all know that the Council of that day was not elected by voting papers, and that it did not represent the profession. A little clique of well-meaning and very respectable men then did what seemed good in their own eyes, and the profession seldom took the trouble to ask what they *had* done—never what they were *going to do*. The profession was apathetic; it did not *object*, but it did not *approve;* and surely now, when the clause is found to be objectionable, it has a right to ask for its repeal. I have taken the trouble to look back in our literature, and I have carefully searched for any record of work done or words spoken concerning this Charter of 1876.

The first mention I find of it is in a report of a Council meeting on October 5th, 1875, when the President brought forward notice of motion for a Supplemental Charter with "power to grant a higher degree" at the next meeting of Council on December 3rd, 1875 (the report of the proceedings of which are published in the *Veterinary Journal*) the clauses of the Charter were, we are told, "considered *seriatim*." The clauses are published, but not one word of "consideration" is reported. At this meeting I find the only hint of any publicity being given to the Charter; it runs thus: "On the motion of the President it was resolved that the draft Charter be printed and circulated among the members of Council and the principals of the schools." As far as I can find out this was the only publicity given, except what might have been obtained through the two monthly journals, one of which, it must be remembered, was then only in its infancy, and perhaps not very widely read.

On January 5th, at a meeting of Council, the draft Charter was considered clause by clause. When Clause 9 was arrived at it will hardly be believed that only two remarks were made, and neither bore any reference to what is now complained of. "Mr. Greaves said he thought the time had arrived when the Board of Examiners should consist of veterinary surgeons only.". . . "The President having expressed his opinion that the Council had the option to appoint examiners, either in or out of the profession, the clause was allowed to remain as it stood." Not one word of explanation was offered, nor was any objection raised. It seems as though the authors of it preserved a discreet silence, and the profession never noticed its drift.

The next notice of the Charter I find is in a report of a meet-

ing of the Yorkshire Veterinary Medical Society, on January 28th, 1876. The report says: "The Supplemental Charter was discussed," and from this we gain a tolerably clear idea of what was understood throughout the profession by the Charter. The President said "Clause 14 was the gist of the whole matter, and he did not think the Charter much use without it." Now, Clause 14 was a protective clause, which attempted to obtain by Charter what we have since got by Act of Parliament. In those days it seems to have been thought that a Charter could prevent men practising as veterinary surgeons who had no diploma, and therefore no right to the title. Upon this clause attention was solely fixed, and every association (there were not many) that noticed the Charter limited its discussion to this one point. One man only seems to have detected the value of Clause 9, and that was George Morgan, of Liverpool, then President or the Liverpool Veterinary Medical Association. Referring to it at a meeting on February 11th, 1876, he says: "In the discussions in Council this clause seems to have been adopted without a murmur;" and he adds: "This appears to be about the most selfish clause that could have been inserted in this or any other Charter, and he who drafted such a clause must have been devoid of conscience." At this meeting a resolution was passed *nem. con.*, "That the Council be requested to withdraw the Charter. This resolution was forwarded to the Council, and read at a meeting of that body on May 14th. It was hardly noticed. Mr. Greaves and the President alone spoke, and both referred only to Clause 14 (the protective clause, which had been dropped). The interest of that Council meeting was fixed on other things, and the next paragraph tells us with a *naïveté* which is now amusing, that "Mr. Dray and Mr. Moon were appointed the dinner committee."

The fact is "Nobody knew and nobody cared." Clause 9 was never appreciated until years after the Charter had been signed, and only then by men who felt the shoe pinch, and who found that they would never get a seat on the Council unless they took the Fellowship. Some commotion was made, the objectors became prominent and popular men; most of them were returned as Councilmen, some became examiners, and all quietly took the Fellowship and ceased agitation. I have looked in vain for any letters on the 9th Clause in our veterinary periodicals for 1876, and have not seen one reference to it in any editorial article. Clause 14 (the lost clause) attracted all the notice, and Clause 9 escaped attention. The Fellowship is not raised by being made a stepping-stone to a seat on the Council. It ought to be "a higher degree," it ought to represent a higher standard of scientific attainments, and it can only do this when its possession is esteemed a sufficient honour without the tacked-on privilege of a sole right to legislate for the profession.

Nowadays vastly more interest is taken by members in our

calling—most men have some idea on veterinary education and examination, most of us take some interest in the scientific advance and social progress of the body to which we belong, all of us have a natural right to share in the duties of a self-governed corporation. It might have been right and wise in 1876 to use this 9th Clause as a stimulus, but I doubt it. It is certainly wrong in 1890 to retain it, when it has been demonstrated to be useless for good but powerful in causing disagreement and disunion.

Against the Fellowship as a Degree no one has said a word. It is decidedly a good thing that men who have entered our profession should be encouraged to keep fresh in their minds the facts and principles taught them at College. By so doing they are able to easily keep abreast of the slow but constant progress of science, and they are better able to understand the phenomena of disease presented to them in practice. The fact that every new member knows he may in five years obtain a higher degree is certainly a stimulus to him to retain some direct association with his books and with the scientific work of other men. Whatever habits are formed during these first five years in the profession will probably distinguish the man for life, and thus, in time we shall have a large body of practitioners who take an interest in their calling for its own sake, as well as for what they can get out of it. Every year the public is giving more and more recognition to the Fellowship, and we should endeavour to keep it free from meretricious attractions—especially such as are unjust to other men and likely to stir up ill-feeling and antagonism. When we separate the Fellowship Degree from all connection with the purely business arrangements of the profession we shall find it more highly valued and more largely sought for. We cannot do this till Clause 9 is abolished; and we cannot abolish it till we have a new Charter.

I think there may be some argument for requiring an examiner to be a Fellow; but this might be left to the Council. I hold that the representative body of the profession should have as free a hand as possible, and that the check on them should not be a legal Charter so much as a watchful supervision of their actions by the profession. It is possible we might some day find a good examiner who was not a Fellow and I see no reason why we should disqualify him. The Council might be trusted to select with care.

The Dual Appointment.—Our original Charter provides that the Council shall be the executive and legislative body of the profession. Its powers cease outside of the corporate circle, but, like every other body, it has external relations, and these may cause the acts of the Council to have a wide effect on persons and institutions not under their governance. As one notable instance I may name the veterinary schools and their students. Very intimate and very delicate are the relations between these and our Council. The point of contact is the

examinations which the Royal College enforce upon the students before admitting them as graduates. These examinations are conducted by a body of gentlemen appointed by the Council, which has full powers to select any one it chooses—with one exception. This exception is thus stated:—"We do hereby expressly declare and enjoin that no professor of any college shall in any way or manner act or interfere as examiner, &c." Now, why this exception? No doubt to guard against the possibility of any personal feeling being entertained, either for or against a student by an examiner. An examiner should be an independent man, free from bias, and above suspicion. Had he any direct interest in the passing or rejection of a student he might rise superior to it, but the framers of our Charter declined to permit even a possibility of unfairness. They recognised that human nature is not infallible, and they expressly declared that no professor of a veterinary school should be permitted to examine. We all recognise the wisdom of this provision, and we do so without the slightest idea that it reflects upon the character of the teachers. We credit them all with being honest and high minded men, we know that they would, from their knowledge and training, all make very good examiners—many of them even superior to the gentlemen to whom we are now limited. More than once our Council has seized the opportunity of the retirement of a teacher from his school to make him an examiner, and never has their confidence been misplaced. No one has ever exclaimed, "It is playing the game very low to suggest that because a man is a professor he cannot act fairly as an examiner, or *vice versâ*." This expression very slightly altered has been used with a different application. It loses sight of the fact that "a man cannot serve two masters," and that judicial appointments in this country are carefully guarded even against suspicion. An examiner should have no special interests in any other body which is affected by his decisions, or which may affect his position. An examiner must have no special interests in the teaching schools—this is recognised by Charter. An examiner must have no special interests in the Council which appoints him and which has to judge his actions—this is not recognised by Charter *but it is our duty to have it so.* It may be argued that, unlike the interest of professor and examiner, the interests of Councilman and examiner are quite distinct and separate. Well, let us consider the point and let us remember that the Charter as at present existing gives an answer to the question "Why on earth should the Council be restricted in its choice of men to act as examiners?" We are now debarred from "obtaining the highest talent procurable because the Charter expressly forbids our using the experts on anatomy, surgery, &c., to be found only in our schools. It does so on sound common-sense principles, which are intelligible to most men; without implying either an imputation on their character or a loss to the profession. It has

been said that "it is playing the game very low to suggest that because a man is Councilman, he may not act fairly as examiner or *vice versâ*." Now I have attempted to show that a similar remark may be, with equal justice, applied to "professor and examiner," but that it is illogical and untrue. All we have to do in either case to show the inconsistency of the dual appointment, is to show that interests exist which are likely to be detrimental. I have said that the office of examiner is essentially a judicial one, whereas the duties of the Council are essentially legislative. There is nothing in common between the two which necessitates the same personal characteristics and acquirements. Out of a profession numbering 3000 members it is surely possible to find men capable of filling these positions singly.

A recent inquirer, after discussing the merits of the different men, arrives at the conclusion that only two men holding the dual appointment can be said to be difficult to replace. I unhesitatingly assert that any one of them might be replaced in either position by men equally as good; and therefore I am convinced that a change that would forbid examiners being members of Council would, at any rate, do no harm to the greatest interest concerned—the interest of the veterinary profession. We are not so poor in talent that the removal of nine men from our Council would permanently injure us, or even that the removal of nine men from our Board of Examiners need cause more than a momentary difficulty in replacing them by men of equal talents and acquirements. The only questions really arguable are—Have examiners any interests which may be furthered by their being Councilmen? and has the body corporate any interests which may be injured by this dual appointment? Upon the decision of these depends the expediency of continuing or altering the existing arrangement. The Council is the governing body of the profession, in whose hands all appointments lie. They appoint the examiners, and as this is an office of honour and profit I hold that it is wrong in principle that a candidate for such office should be in a position to assist directly in his appointment to it. That this self-appointment is wrong is evident; but it has not been publicly recognised that the evil is growing. Not long since only a few men held dual appointments; now nearly one third of our Council consists of men holding a paid appointment, and we may look forward to the time when a slight extension of the usage shall give a numerical majority on the Council to our examiners, who may then pass resolutions for their own election and emolument.

A greater evil than this exists. The examiners are the portion of the body corporate in most direct contact with the schools; they are the authorities to whom is entrusted the care of admitting or rejecting candidates for the diploma, and they are therefore most likely to be misunderstood by, or to misunder-

stand, the two great entities outside but most nearly related to us—the teaching bodies and the students. In case of any disagreement the Council is responsible, and must adjudicate upon the conduct of the examiners. Does any sane man assert that a Council, one third of which are examiners, can impartially decide? In what other branch of life do we find a judicial body inquiring into the acts of its paid subordinates with one third of its numbers made up of those subordinates? It is not difficult to see that when the Council have to consider the actions of the examiners, they will be able to do it more impartially if no examiners are permitted to sit in judgment upon themselves.

It is wrong that a man should be able to use his vote and interest in favour of gaining a paid appointment; but it is far worse that a man should sit on a judicial body when his own acts are under discussion. Such a position is quite incompatible with impartial justice, even if it does not overstep the bounds of common decency. The fact that conflict between the two bodies has not arisen has alone prevented members from recognising this anomalous position. Once indeed it seemed that a conflict was imminent, and we outsiders (we members of the profession) do not even now know that the conflict was not hushed up by the convenient action of the dual appointment. I think this short statement effectually answers my first question —Have examiners any interests which may be furthered by their being Councilmen? and the answer carries with it an insuperable objection to the dual appointment.

If it be true that Councilmen elect themselves as examiners, or that examiners are able to vote for their own election, it is certainly injurious to the interests of the profession. If a large portion of our Council consists of examiners it is clear that the Council cannot properly consider the action of the Examining Board, and may be induced to decide questions of grave importance without that impartiality which is necessary to make a judicial decision respected. For these reasons I arrive at the conclusion that the profession is directly injured by the action of the dual appointment, and I conclude that a Councilman is no more desirable than a professor in the office of examiner. We want our Council to be above suspicion as much as we do our Board of Examiners, and we recognise that the provision made by our Charter against professors is quite as urgently needed against Councilmen. I make no accusations against our Council, and I am convinced of the honesty of our professional staff, but just as the Charter objects to professors as examiners, so I object to Councilmen. Human nature is weak, it is liable to unconscious bias, and every precaution must be taken to prevent injustice and to protect men against themselves. Assertions and arguments as to the merits of individuals must not be allowed to blind us to principles, nor to weaknesses in our constitution which are more than "possible" dangers, and we must, if needs be, sacrifice a man or two to the good of the pro-

fession. What we want is a Council that will do justice, and an Examining Board of capable men. We can have both without any dual appointments, and we can only expect impartiality when the two offices are separated. To effect this separation we must have a new Charter.

There may be more reasons, gentlemen, for a new Charter than I have given, but I submit that the three great alterations suggested are in themselves sufficient warrant for our insistence. I quite appreciate the difficulties and dangers of altering the Charters upon which the profession is constituted, but I find we have already, without very serious harm, obtained three Charters since our original instrument of incorporation. I ask you to say that another is wanted, and that our Council should be called upon to carefully consider what alterations are desirable and how best the applications should be made.

As the Council is a representative body it is for the profession to indicate the direction in which alteration is desired, and I submit to this Society—and I hope also to other associations of my fellow-practitioners—that the three subjects I have discussed are prominent amongst the alterations required, and should find recognition in the much-wanted new Charter.

Mr. Burrell thought they should congratulate themselves that they had such a powerful advocate as their President. He would not deny that injustice had been done to some members of the profession by Clause 9, but he did not think they should make that the basis of their action. If that was all they had to say about it, they had better drop the agitation altogether. They ought to show that the repeal of the clause would *be good for the profession at large.* Some few years ago, when speaking on the subject at an annual meeting, he expressed the opinion that this clause would prevent them having a fully representative Council, and that observation had been borne out by what they had seen. He thought they should look at it in the light that the corporate body was deprived of the services of good men, and not regard it so much in the light of a personal injury.

Mr. Hurndall congratulated the chairman upon the able manner in which he had introduced the subject. So fully had he dealt with it that, so far as he could see, it left little room for anybody else. At the meeting of the National Veterinary Association held in Birmingham some time ago he advocated the alteration of this Clause 9. He remembered Mr. Kidd doing the same, but since then that gentleman had presented himself for examination. It seemed to him (the speaker) that the Council appeared to have taken no notice of the wishes of the profession. A representative body should do so, even if it was not really in consonance with their own views. If they could not consistently advocate principles that they were sent to represent, then they should resign their places on the Council. (Hear.) Some of the Council when they were elected promised

to do something towards having the wishes of the profession carried out, but nothing had been done, and that he looked upon as a direct insult to the profession. He had little hope of the Council giving them any assistance in this matter until a sufficient amount of new blood was introduced, which meant the expiration of a number of years. As an outcome of the discussion, he hoped some resolutions would be unanimously passed and sent to the Council. He did not quite follow Mr. Burrell as to making Clause 9 a personal matter. For himself he had never made it a personal matter, and had always looked upon it as a matter that affected the whole body corporate. A clause had been inserted in the Charter which deprived eight tenths of the profession of rights which they enjoyed up to a certain period. There was a decided majority against the change at the Birmingham meeting which he had referred to, and that being so, the question deserved some consideration at the hands of the Council at the time. The only argument on the other side appeared to be this—that the gentlemen who had paid fifteen guineas were not disposed to be deprived of rights that they had paid for. He could give the names of several who had said this, but comparisons were odious. The Fellowship degree should not be one merely of gain, but should also indicate scientific attainment. He was obliged to the chairman for having brought forward information with regard to the publicity given to the Charter and to this clause. At the Birmingham meeting he expressed the opinion that he did not believe sufficient steps had been taken to learn the will of the profession in the matter. A circular should have been sent to every member of the profession as to what was proposed to be done. He would not say that it was not done with the best intentions, but certainly a mistake had been made. It had been said that an injustice had only been done to those members of the profession who passed prior to 1876, but subsequent members were entitled to the same rights in virtue of the earlier Charter.

As to the "dual appointment," there was the objection that they could not expect to have the work of the examiners properly reviewed so long as they governed a part of the Council. It would certainly have been desirable to have fuller information with regard to the Edinburgh disturbances. He felt sorry for the gentleman who was then given the cold shoulder, and believed an injustice was done to him.

The point respecting the Vice-Presidents was an important one, and had been very clearly put by Mr. Hunting. The Council at present could elect men who might be anything but reformers. It would certainly be far better if the Council was increased to thirty, sat for three years instead of four, and if ten retired each year. He hoped something would arise out of this meeting to show that there was a desire on the part of the profession that some active steps should be taken to obtain a new Charter, so that these matters might be revised and altered

to meet the wishes of the majority of the profession. (Applause.)

Mr. Mulvey said he had so often spoken on this subject that it was unnecessary for him to say much that night. He cordially endorsed all that Mr. Hunting had said, and begged to move—"That the Central Veterinary Medical Society, with the view of obtaining information respecting the desirability of obtaining a new Charter, request the Secretary to place himself in communication with all the veterinary medical societies, in order that the question may be fully discussed and all their views obtained."

Mr. Hurndall seconded the motion.

Mr. Raymond said he should like to move an amendment that the debate should be adjourned for a month, as they then would be able to draw their conclusions from what had been said.

Mr. Burrell thought the two propositions could be carried out.

The original resolution having been carried, it was understood that the question would be further considered.

Mr. Rowe then said he should like to trespass on their patience for a minute or two. Mr. Greaves, as they knew, had presented to the Council Room, at Red Lion Square, double windows to improve the acoustic properties of the room, and to deaden the sounds of traffic outside. This had completely spoiled the effect of a stained-glass window put in by this Society. He had complained at the annual meeting, but was told that he should "not look a gift horse in the mouth." The woodwork was much too heavy, and he was intensely upset, and would not rest until it was removed. He moved—"That the Central Veterinary Medical Society, who contributed one of the windows of stained glass in the Royal College of Veterinary Surgeons, whilst acknowledging the generosity of Mr. Greaves, viewed with regret the introduction of a framework in front of it, and respectfully requested its removal, as 'the artistic effect was totally marred' by its presence."

Mr. Raymond seconded the resolution, which was carried unanimously.

The meeting then adjourned to the first Thursday in July.

SIDNEY VILLAR, *Hon. Sec.*

LINCOLNSHIRE VETERINARY MEDICAL ASSOCIATION.

THE quarterly meeting of this Association was held at the Lumley Hotel, Skegness, on Thursday, June 26th. Present: F. L. Gooch, Esq., F.R.C.V.S. (the President), in the chair; Messrs. W. H. Brooks, Fulbeck; W. B. Dickinson, Boston; B. Freer, Uppingham; J. W. Gresswell, Peterborough; C. Hartley, Lincoln; F. A. Holmes, Hemswell; J. Mackinder, Peterborough; T. J. Marriott,

Bottesford; Captain B. H. Russell (Treasurer), Grantham; T. A. Rudkin, Grantham; T. Smith, Market Rasen; J. Smith (Hon. Sec.), Huntingdon; and Messrs. Mellish (America) and Kemp as visitors. Letters of apology were read from Professors Pritchard and Walley, and Messrs. Greaves, Hardy, and Wragg.

The *President* then delivered his inaugural address, as follows:

Gentlemen,—My first duty as President of your Society for the ensuing year is to thank you for the very kind expression of gratitude for my past services as secretary, and also for the unanimous vote at your last meeting in electing me as your officer at the head of affairs. You who were present at that meeting will remember that I accepted the presidential chair with much reluctance. I had my reasons for so doing. First, I considered that, although I had acted as secretary for nearly four years, I had only done my duty to the Society as one of its members; and there were other members who had a prior claim to the chair, men who were better able to fill it than I was, men who had been vice-presidents of the Society, men who had given us a taste of their literary ability in bringing before the Society some useful paper for discussion, and who were much older and more experienced than myself. Secondly, I felt I had not the time at my disposal to fill the chair with satisfaction to myself and to the members of the Society. Thirdly, I thought that a member ought first to be elected as a vice-president; and I should certainly like to see it added to our rules that no member can be elected to the presidential chair until he has filled the office of vice-president for at least twelve months.

In a president's inaugural address I do not think it would be out of place for me to take a retrospect of the Society's working since its commencement. The Lincolnshire Veterinary Medical Association was formed at the Albion Hotel, Lincoln, on January 18th, 1883, so that it is now seven years old. At that meeting thirteen members of the profession were present—now we number about forty. Our present worthy treasurer was elected unanimously to the presidential chair. Since that time I think we have been progressing slowly but surely, which may be accounted for in more ways than one. Although a few of our members reside out of the county, only one county enters into the formation of the Society; but still there are quite sufficient members of the profession residing in Lincolnshire alone to make one of the largest societies in England, if so much apathy were not shown in joining the Society and also in attending its meetings. Another reason, I think, is the bad railway accommodation to the towns in the county, more especially the northern part. Financially we stand very well, for I believe we have a balance in hand of about £15—not a very large sum, but still it is on the right side. Since I joined the Society I have asked many members of the profession to join us, and as an answer this question has been asked: What is the use of joining, and what good will one derive from it? and although I thought it a very selfish question, I was able to answer it by affirming that I for one had

received immense benefit from being a member of the Association, not only by hearing papers read and taking part in the discussion thereon, and hearing the opinions of its different members ventilated, but at the social table afterwards I have gained many little practical hints—just the very ones I have wanted. I think that is a place where if young practitioners—yes, and old ones too—will but enter into conversation, they will hear not only the opinions of the day ventilated, but if a practitioner has had any special case, it is almost sure to be told around the convivial board.

Since I was admitted a member, our profession has made rapid strides to get on an equality with the sister profession, and not without a fair amount of success. We have not only advanced in surgery, medicine, &c., but also in position. Particularly is this noticed in the Army Veterinary Department. Then, again, our literature certainly gives evidence of our progress, and it will repay any member who is not given much to reading to peruse the various veterinary periodicals for the last twelve months, wherein he will find cases of skilful surgery ; original essays on different scientific subjects, and also a large amount of research into the causes of many diseases which before were only vague and founded upon supposition. Particularly is this the case in the many diseases that have been traced to forms of bacteria and parasitic causes. It is said with truth that the professors of human medicine have more leisure and better opportunities for research and experiment, but I think we have men in our profession who have raised its position not only in the eyes of the sister profession, but in the eyes of the public generally by their research and contributions to veterinary literature.

In looking through the *Veterinary Record* for last week, which, by the way, I think we ought as country practitioners to be very thankful for, for through its pages we are made acquainted with everything that is going on in the profession up to date ; whereas before it was started we were a whole month, and very often longer, before we heard about anything that was going on in the Council chamber or elsewhere, so that we were not enabled to express an opinion on any subject of discussion until very often it was too late ; and I also think we ought to assist the editor by sending him such accounts of cases that have been beneficial to ourselves, and thus enable him to publish them for the advantage of the other members of the profession. The article I saw in the *Veterinary Record* was on the Infectious Diseases (Prevention) Bill, which was introduced into the House of Commons by Mr. Lees Knowles, and in which I considered there was one clause at any rate concerning the veterinary practitioner in which he was entirely overlooked, viz. that a medical officer of health should inspect a dairy, and if he suspected infection he could immediately stop the sale of milk from such dairy. These points were objected to, but passed to the standing committee. The Central Chamber of Agriculture took the matter up, and after securing a postponement of the Bill, sent it to Mr. Knowles with this amendment : " That the medical officer should be accompanied

by a veterinary surgeon ;" and one member suggested that the words "properly qualified" should be placed before the words veterinary surgeon. My opinion, gentlemen, of the members of the sister profession in general is that they are far more at home in a lady's drawing-room than in a cow-shed or slaughter-house, and I think if the Bill had been passed it would have been a direct insult to the veterinary profession.

I should very much like to see the Lincolnshire Veterinary Medical Association larger in numbers, and should suggest that if every member would bring all his influence to bear on some one member of the profession not at present a member of the Association, and persuade him to join, we should immediately double our numbers. At the same time we have certain members of the profession (shame be to those members!) who are not fit to join us, and I for one would be the last man to propose such as members. Still there are, I believe, something like eighty members of the profession in Lincolnshire alone, and I think we should persuade some of them to join our ranks.

Gentlemen, in conclusion, I again thank you, and trust if am spared to see the close of my year of office I shall employ every endeavour to make the Lincolnshire Veterinary Medical Association quite equal if not superior to the leading veterinary medical associations both in numbers and position.

After the President had been thanked for his address, the minutes of the last meeting were confirmed, and the letters of apology for non-attendance were read by the Secretary. It was decided to hold the next meeting at Lincoln.

Mr. Dickinson then read his paper on "Electro-Therapeutics."

MR. PRESIDENT AND GENTLEMEN,—Electricity has probably the brightest future of any known science : its value as a remedial agent in the lower animals is not so much recognised as I hope it will be in the future.

It is a force which is developed in many ways, the result being essentially the same under all circumstances. Frictional electricity is obtained by rubbing two surfaces together, and is hardly ever resorted to in medical or veterinary practice. Electricity is generally obtained by the union of two dissimilar metals, and is then called galvanism.

It is not my intention to speak of the merits or demerits of any particular arrangement which generates the current of this power, but to confine myself strictly and briefly to the success of its use as applied to animals.

I have practised galvanism since 1879, using Leclanché, Spamer's, and the magnetico-galvanic batteries. I find the last mentioned the most useful and serviceable to the veterinarian for two reasons —first, it is less expensive and very portable ; and secondly, it rarely gets out of order, and can be left and used by the attendant on the patients. By the use of these so-called magnetico-galvanic machines the interruptions are very rapid, the to-and-fro currents

separate from one another. The succession of these currents in one direction have all the chemical effects of a steady current—in fact, they produce the same if not better results than chemical currents. In employing galvanism it requires the utmost patience and strict observation by those who wish to have success with its employment. They must persevere daily, possibly for a week or ten days in some cases, before any benefit is apparent in the condition of the patient, whereas in other patients restored muscular function is noticed after three or four shocks of short duration.

It must be plainly understood that this power, or therapeusis, is not set forth by me as an agent to cure every form of muscular or nervous inability, therefore a correct diagnosis as to the true cause of the motor inactivity must be ascertained before faradization is employed.

When the spinal centres lose their influence upon a muscle or group of muscles there is a loss of electro-contractility, whereas if the paralysis exists in the muscle or group of muscles from a lesion, so as not to interfere between them and the nerve-cells of the cord, their integrity is maintained for many weeks. When a muscle is degenerating for want of spinal influence the power of response to slow currents is lost.

This condition I have more especially seen in mastiffs, particularly in the hinder extremities, where atrophy of the gluteal muscles is first noticed, and paralysis supervenes, thus showing the spinal centres have lost their influence in this particular instance.

I have noticed in the hinder extremities of cattle with apoplexy total destruction of electro-muscular contractility, which probably proves the lesion to be in the nerve-trunk—for instance, clots in the lumbar region or cauda equina.

One celebrated author says—"It may be laid down as a practical rule that when, in an adult, a muscle loses, to a sensible degree in a few days, its electro-contractility there is no doubt of the situation of the lesion, which is in the nerve-trunk."

In hemiplegia I have seen some remarkable changes from the use of galvanism, but it must be remembered that there are two factors which account for the paralysis. The organs of motor power lose their structural integrity from want of use, succeeding the injury to the nerve-centre, the restoration of which does not necessarily involve the restoration of this motor influence. The cerebrum may totally or partially recover, while, from its long-standing impairment, the muscles become degenerated when there is no response to the impulse given by the application of galvanism. This will account for unsuccessful faradization in some cases.

In case of hemiplegia existing from one to two months I have seen the most brilliant results from this treatment after all others have failed. Once, in acute rheumatism in the horse, I employed electricity with good result. The animal, a five-year-old gelding, was affected in the hip-joints with metastasis to the patella and hock.

In facial paralysis, or "drop-lip," in the horse, where there has

been inability to gather food or to drink, except under difficulty and after ordinary treatment, such as fomentation, blisters, &c., galvanism has effected all that could be desired after being employed from fourteen to fifteen days.

In *ante-* and *post-partum* paralysis in cows and mares—especially in cows, which I have seen exist seven days before and as many as thirteen after calving—there was complete and permanent recovery from motor inability after the first four or five days from two shocks per diem in the recumbent posture.

In cattle suffering from gastric derangement, impaction of the rumen, and paralysis of the hindquarters, which condition, I think, is due to some interference with the semilunar ganglia and the lumbar portion of the sympathetic system manifested by loss of muscular power, suspended rumination, and loss of milk. In the course of two or three days, after giving mild saline purgatives, &c., I use the battery, when after two or three shocks rumination and gentle purgation is soon established, and the wished-for upright position is agreeably welcomed by all concerned.

Galvanism is also very useful in the horse in loaded colon, when the action of the bowels is suspended, also in torpidity of the bowels. It has a marked effect in all cases where medicine often fails in bringing about what is desired. In all cases of loss of muscular power where the brain is affected I withhold galvanism, because a direct shock can only do harm and produce pain by acting as a direct irritant.

As an adjunct to the treatment I have adopted a very convenient method with dogs suffering from lumbar paralysis. Instead of troubling with manipulating the battery poles, I place the poles in a dog-bath containing water sufficient to cover the feet or legs, place the dog in, and then set the battery in motion, taking care that the dog is muzzled and the top of the bath is covered over.

I have adopted different methods of applying this treatment, viz. by using flattened pieces of brass, with sponge attached and enveloped in wash-leather, using them as poles. This method answered very well as long as the patients were unable to rise, otherwise it was objectionable on account of restlessness while undergoing the shock, hence the difficulty in keeping the poles in their position. This I endeavoured to obviate by the use of a girth over the poles, but failed in most cases. After many trials with the girth, I resolved to try a method which might to some appear inelegant and cruel, but the end justifies the means. The battery wires are attached to two brass needles, from six to eight inches in length, which are pointed at the end. I make an incision in the skin with a pair of small rowelling scissors, then introduce the needles to the extent of about one inch subcutaneously, and, no matter how much the patients fight, it is impossible for the needles to get misplaced. The time occupied in producing the shock for the first two or three operations varies from three to five minutes, increasing to twenty minutes, once or twice daily.

In conclusion, gentlemen, after the most careful observation for the past few years on the therapeutic value of this power, I am quite confident you may use it to a very great extent with as much success as I have done in most of the palsies animals are the victims of.

Captain Russell congratulated Mr. Dickinson on his paper, and said he was fully persuaded that there was a great field for magnetism as a therapeutic agent, especially in *post-partum* paralysis, and also in the treatment of wounds.

Mr. Freer, after thanking the essayist, said he had not had much experience in the use of a battery, but had seen good results from the application of magnetism, especially in *post-partum* paralysis. He was also of opinion that it should be tried in chorea or incipient shivering in young horses.

Mr. Gooch said he had proved it a useful agent in the treatment of paralysis following distemper in dogs.

The meeting closed with a vote of thanks to Mr. Dickinson for his paper. The members afterwards dined together.

JAMES SMITH, *Hon. Sec.*

LAHORE VETERINARY SCHOOL.

DISTRIBUTION OF PRIZES AND DIPLOMAS.

THE award of the diplomas and prizes to the students of the Lahore Veterinary School took place on 12th May at the Lawrence Hall, Colonel Beadon, Commissioner of Lahore, presiding.

A very large assembly of supporters and patrons of the school were present on the occasion, General Black, C.S.I., Governor of Aitchison College, being amongst the visitors.

On opening the proceedings Mr. Kettlewell, the Principal, gave a very appropriate address, from which we make the following extracts:

"Colonel Beadon and Gentlemen,—To-day is the seventh anniversary in the history of the Lahore Veterinary School.

"Since the occasion on which Lord Dufferin, as Viceroy of India, honoured us by his presence at the school, on a similar occasion to this meeting, over which you, Colonel Beadon, so kindly presides to-day, there has been a very great addition to the number of qualified veterinary assistants passed out by the school.

"In six years, counting from 1883, the number of veterinary assistants passed out of the school up to 1888 inclusive was one hundred, or on an average about sixteen qualified assistants per annum.

"In the last two years double this number have passed the final examination, and, including one graduate passed in English, the number shows sixty-four.

"Last year the Board was of opinion that the results of the final examination were most satisfactory, which they attributed to the increased accommodation and facilities for teaching, and especially to the appointment of native hospital assistants and house surgeons as teachers; and the Board on that occasion strongly recommended that these men's services be recognised by an increase of salary, which, however, I regret to say has not been sanctioned up to now.

"In the examination concluded at the end of last month the results were still more gratifying, as in a list of forty-five students thirty-eight succeeded in passing the Board, twenty of them in the grade of first class—a number far in excess of any previous year.

"The remarks by the Board this year on the qualifications of the students generally were very encouraging, more especially on the two subjects of anatomy and physiology, taught by Mahtab Shah, a graduate of the College, who fills the post of Lecturer and Demonstrator of Anatomy.

"It matters little what other qualifications a student may possess, the results of long experience lead to the conclusion that none can rise to distinction without the knowledge and aid which anatomy and physiology afford as landmarks and guides throughout a professional career."

Mr. Kettlewell, having next given some excellent advice to the students, passed on to remark that:

"It has been known for some time past that Mr. Nunn is to succeed me as Principal of the school, and this change may occur at any moment.

"The good work done by Mr. Nunn in the province, and especially at the time he was connected with the school, is placed on record; and all I can say is, in adding my mite of praise, that I know of no professional officer more deserving of reward for past services than Mr. Nunn, and that the appointment as head of the school of such a zealous officer augurs well for the institution in the future.

"Regarding my own share in the progress and advancement of the Lahore Veterinary School I prefer to remain silent—

> 'I've done my duty, and I've done no more.
> Enough! if something from our hands have power
> To live, and act, and serve the future hour.'

GENTLEMEN,—"In conclusion, I beg to offer my grateful acknowledgments to Colonel Beadon for presiding on this occasion; and to the visitors and those who have honoured us with their presence to-day I return my most sincere thanks."

Colonel Beadon then replied:—

"Mr. Kettlewell, Gentlemen, and Students of the Lahore Veterinary School,—An honour has been done me in my deputation to preside at this distribution of prizes to successful students.

"Though I have never taken an active part in the advancement of this educational institution, I have at all events with no little interest watched its birth and progress during a long term of years, and I am certain that it is opening out a large field for professional

distinction and gain, at the same time that it is doing an immensity of good, not only in the diffusion of veterinary science, but also in the alleviation of suffering in dumb animals.

"We have listened to Mr. Kettlewell's report, and I venture to think we must admit it is one of progression, satisfactory and creditable to all concerned. I have not come here prepared to review statistics in the out-turn of beneficial operations, but to distribute these elegant prizes to those who have earned them. But before doing this I should like you to join me in wishing long life, health, and prosperity to your retiring Principal, Mr. Kettlewell.

"His services to Government have been long, faithful, and meritorious, extending, I believe, over a course of thirty-six years. But his crowning efforts have been in connection with this school, which he has fathered from its beginning with unflagging devotion, to which circumstance alone it owes its present condition of fame and prosperity."

The Prizes were then distributed to a number of native students as prize winners at the examinations, 1889-90, in Anatomy and Physiology—Materia Medica and Chemistry—Veterinary Surgery and Medicine, and Bovine Pathology. Also to First and Second Class Veterinary Assistants; and to Abdula Khan Hazara, a special General Proficiency Prize.

Colonel Beadon's and Mr. Kettlewell's addresses were afterwards translated and read to the students and the public in Urdu, by Lala Agar Sain, translator to the school.

Veterinary Jurisprudence.

THE DISHORNING OF CATTLE.

Test Prosecution at Kells.

We insert, by special request, the subjoined report of a case of prosecution for dishorning cattle in Ireland. The report is somewhat condensed from the *Farmers' Gazette* and the *Irish Times*, but the professional evidence is given in full, as published in the *Times*.

Mr. F. B. Henn, R.M., and Mr. John Keating, J.P., sat July 4th, and two following days, in the Court-house, Kells, for the purpose of adjudicating upon a *test case* concerning the dishorning of cattle, brought by the Crown under the Act for the Prevention of Cruelty to Animals.

The summons, which was at the instance of District-Inspector Newland against James M'Donagh, charged the defendant with having caused the horns of certain oxen—to wit, 26 oxen—to be cut off, and with having otherwise cruelly ill-treated the said oxen on the 17th day of April, 1890, at Carlanstown, in the county of Meath.

Counsel for the prosecution—Mr. George Hart (instructed by Mr. George Keogh, Crown Solicitor).

For the defendant—Mr. John Ross and Mr. J. Kenny, M.P. (instructed by Messrs. Reeves and Son, Dublin).

The defendant admitted the acts complained of, but pleaded justification.

Professional Evidence for the Prosecution.

Professor Walley, Principal of the Royal (Dick) College of Edinburgh, and member of the Royal College of Veterinary Surgeons, deposed that he had made the subject of the dishorning of cattle a study for fourteen years. He produced a drawing of the section of the horn, made by himself. In young animals there was no horn. It was a secondary growth beginning after two months. When it began its growth it was not attached to the skull, and by cutting it you only cut the skin at the base of the horn. You could move the horn about with the fingers then, but afterwards it got firmer. He then gave an explanation of the structure of the horn, and stated that the cutting of it off caused intense pain. The result was that there was always some fever, and frequently severe fever. From his knowledge of the nerves and blood-vessels of the horn he knew that the operation caused great agony. The removal of the horn would tend to conceal coarseness of breeding, and it was done for that purpose in some cases. Proper surgical treatment immediately after the operation would minimise the pain. If only the tip of the horn was cut off, as was done in Scotland, no pain would be caused, as the bone would not be touched, and the animals would not gore one another. In his opinion there was no justification for this cruelty. If breeders only knew their interests in this country they would get polled bulls ; 85 per cent. of their progeny were without horns. He mentioned that the practice of putting knobs on horns would serve the purpose of dishorning. If, however, dishorning must be performed, it should be when the animal was very young. The fact that an animal ate or chewed the cud after the operation was no evidence that pain and suffering were not caused.

Cross-examined by Mr. Ross: The operation was cruel and unnecessary. The after-effects caused greater pain than the operation. The polled Angus cattle were not so good for dairy purposes.

Professor William Pritchard, ex-President of the Royal College of Veterinary Surgeons, London, deposed that he considered dishorning cruel and unnecessary. If the horns were tipped with brass knobs, butting and goring could be prevented. He would advocate a more general breeding and rearing of polled cattle. He knew that dishorning was not practised in the Midland Counties of England. The meat of the animal was not improved by dishorning, nor was the animal improved in any respect. The object of dishorning was to prevent the animals injuring each other. The operation produced agony and inflammation of that part of the head, which lasted several days.

Cross-examined by Mr. Kenny: Cattle had, to his knowledge, died from having been dishorned.

Professor John Woodroffe Hill, of Downton Agricultural College, deposed that he had studied the subject of dishorning, and, in his opinion, it was both a brutal and unnecessary operation. In England it was not practised. The operation as described in this case was decidedly cruel. He would say that such an operation was more painful than the tearing out of a human nail. As the horn was secreted from a very sensitive structure even a sharp blow on the horn was very painful. In some instances where cattle were dishorned and the cavities filled with tow and tar, matter or pus would exude if pressed with the finger. One object of dishorning in such cases was to pass off the animal as a polled one. The practice was also carried out to make a greater number of cattle fit in a smaller space.

Cross-examined by Mr. Ross: He thought it unnecessary to dock a horse, as he condemned all sorts of mutilation. Dishorning would not add to the quantity of flesh on the animal, nor would it improve the quality. He did not consider that dishorning was justified by thirty shillings or a pound more being given for polled animals. His opinion on the subject would not be altered by hearing that to abandon dishorning would cost Ireland £400,000 a year.

Mr. Francis Frederick Collins, veterinary surgeon for thirty-eight years, thirty of which was passed in the army, deposed that he considered dishorning caused great agony. It was believed by some persons that bullocks grew larger after having been dishorned. In some instances it was practised to conceal the coarse breed or age of an animal.

Cross-examined by Mr. Kenny: He believed that "tipping" was as effective as dishorning.

Re-examined: He did not think that dishorning intrinsically improved the animals. If two animals of the same age were reared together—the one dishorned, and the other with his horns—there would be no difference between the animals, provided they were of the same breed and their feeding was the same.

Professor M'Queen, of the Royal Veterinary College, Camden Town, and Professor J. W. Axe gave similar testimony.

This closed the case for the prosecution.

Second Day.

Mr. Ross, having addressed the bench for the defence, called *Professor Wallace*, Professor of Agriculture, Edinburgh University. He deposed, in reply to Mr. Kenny, that he had frequently removed the horns of animals, and had seen them removed. He believed that the pain produced was only momentary. The operation should not be performed by a veterinary surgeon necessarily, but by a skilled man. He had seen it done in from three to ten seconds. The budding horns of calves should be removed by a sharp knife, cutting into skin and hair to prevent the growth of "scurs" or imperfect horns. When adult cattle were being dishorned, he dis-

approved of the use of the knife. The saw only should be used, and thereby a second operation was prevented. The advantages to be derived from dishorning were that animals did not abuse each other; that they settled quietly to feed; and, further, the meat of animals dishorned was superior, although the scientific reason has not yet been ascertained. They had only commenced three years ago to dishorn cattle at Chicago, and the percentage was now increasing. Ten years ago there was not a dishorned animal there. The reason, he believed, was because polled cattle could be shipped along with cattle of other breeds which had been dishorned. Up to that time an enormous number of cattle had been lost by being gored, and he thought the amount of money now saved compensated for the pain suffered by the animals. In the Madras Presidency young cattle were dishorned by a red hot iron being applied to the tip of the budding horn; only during the operation acute pain lasted. They ate well afterwards and continued to thrive without a check. He did not approve of tipping the horns, although ripped wounds might thereby be prevented. Still the flesh of the animal butted would be bruised. Knobs were commonly put on cows, but they were never put on bullocks except for ornamental purposes. It was painful for the animal to butt with a knob or ball on its horn, and it also might cause the animal to slough or cast the horn. At the cattle stations in Australia very many cattle were injured, as he had seen, and he thought it would be well to dishorn cattle there. When the horns were removed the animals became more peaceful and throve better. He did not consider that the crossing of the pure-bred polled cattle with ordinary horned cattle would produce a breed within the present generation that would give satisfaction. The dishorned cattle were worth about thirty shillings more than horned cattle, because they fed better. Dishorning was increasing in England and Scotland, spreading from those places where the people had had experience of polled cattle. Bellowing was as often the result of fear as of pain.

The court adjourned.

Third Day.

Mr. Peter A. Lawlor, V.S., Dublin, deposed that during a practice of fourteen years he had seen thousands of dishorned cattle. He had seen the operation performed. He did not consider it very painful. The pain was substantially over when the operation was performed. He did not consider any treatment necessary after the operation. Horned cattle injured one another, but dishorned ones did not, and they fed better. When milch cows were dishorned the after-quantity of milk did not diminish.

Cross-examined: Fever sometimes resulted from the operation.

Mr. James M'Kenny, V.S., Dublin, deposed that he considered the practice of dishorning existed largely in Ireland, and to be increasing as people found the advantage of it. He considered that the horns cut off the defendant's cattle had been properly

removed. The pain of dishorning was momentary, and the operation could be performed in a few seconds. There was not much after-pain when the operation was properly performed. In his opinion the animals were improved by having their horns removed. He was not acquainted with any substitute for dishorning; tipping was only a temporary remedy. The cutting away of budding horns from calves was rather dangerous, as the operation was a delicate one.

In cross-examination, the witness said that dishorning caused a little more pain than disbudding. It would be better to disbud each calf if the practice was necessary. In all cases the wounds left after cutting off the horns should be dressed. He believed dishorned cattle to be of more value than polled cattle.

Mr. Thomas Greaves, ex-President of the Royal College of Veterinary Surgeons, Manchester, and Fellow of the same College, and Consulting Veterinary Surgeon to the Society for the Prevention of Cruelty to Animals, said he had believed at one time it was sufficient to dishorn fighting cattle, but he had found that when the bully was dishorned another bully took his place and kept up the unrest in the herd. He believed dishorning to be reasonable and humane when done properly. The pain was trifling, and only lasted for a few days. Dishorned cattle could not feed beside horned animals. He was not acquainted with any practical substitute for cutting off the horns.

Cross-examined: The result would be the same to take off the budding horns from a calf as dishorning. He had opposed dishorning until a meeting held in Edinburgh six months ago, when he was convinced that the dishorning of cattle was necessary.

Mr. Freeman, V.S., Dublin, deposed that he did not consider the operation cruel, but regarded it as reasonable and justifiable. After the operation there was no diminution of milk, and no elevation of temperature.

In cross-examination, he stated that the horn in a young calf could not be moved with the finger.

Mr. Reilly, V.S., Navan, also gave evidence, and in cross-examination deposed that for a week after the operation of dishorning the animal was in a bad condition.

Professor Williams, Professor of Pathology in the New Veterinary College, Edinburgh, also gave evidence. In cross-examination he deposed that in the case of a calf there was bone attaching the base of the horn to the skull. The horn could not be moved about by the finger.

Mr. Simcox, V.S., Drogheda, who saw the defendant's cattle a month after the operation, deposed that he was of opinion that the operation in each case was performed skilfully.

The case for the Crown being closed,

Mr. Hart asked permission to go into rebutting evidence in reference to the disbudding of calves. It had been sworn for the defence that the bud was fixed to the skull, and he would reproduce Professor Walley to give evidence on that point. He con-

tended that when the animal was a calf the operation could be performed with the infliction of comparatively no pain.

Mr. Ross objected to a rebutting evidence.

Mr. Henn, R.M., said that Professor Walley had already sworn that the budding horn could be moved with the fingers and could be easily "disbudded." He would, however, take a note of the application.

On Saturday, as has been expected, the summons was dismissed, the magistrates, however, consenting to state a Case for the Queen's Bench Division of the High Court of Justice in Ireland.

In delivering the decision of the bench, *Mr. Henn* (having remarked that the various authorities which had been quoted by counsel on both sides were as conflicting as the evidence which had been brought before them) said: "We are of opinion from the evidence that the operation of dishorning causes considerable pain, and may in individual cases cause great after-suffering to the animal. We are further of opinion that the defendant had no intent to cause pain in performing the operation, but that he so acted honestly believing it to be for the benefit of the animals and of himself as a grazier. We are satisfied on the evidence that the dishorning of cattle increases their market value, renders them more saleable, is customary, and if suppressed would inflict very large pecuniary loss on the community. Cattle when dishorned appear to thrive better, to become quiet and easily handled, less dangerous to men and each other, and less liable to suffering on pasture and when travelling. That the practice of dishorning has been carried on to a considerable extent in parts of Scotland, and at least in one county in England, and that it is widely prevalent and daily increasing in Ireland, has been made plain to us. We believe that the straw-yard feeding, both in open and closed yards, is reasonable and necessary, and that as practised in Ireland is advantageous to the animal, and would be seriously injured by the suppression of dishorning; that there does not appear to be any other practicable method causing less pain by which the same objects sought to be attained can be carried out, provided that it be skilfully performed. We consider that the advantages attainable by the operation of dishorning are out of proportion to the pain suffered by the animal. We find as a matter of fact that in this case the operation was performed with reasonable skill and care, causing at the same time a certain degree of pain, for an adequate and reasonable object not otherwise attainable. Having thus found the facts of the case as disclosed by the evidence, it would follow that we are of opinion that the case should be dismissed on the merits. We consider that the defence of justification should prevail, notwithstanding the recent decision in the case of Forde *v.* Wiley; and, having regard to the serious conflict of authority which exists on this subject and its paramount importance to large sections of the community, we have, in the best exercise of our judgment, decided to dismiss the case on the merits.

FITZWYGRAM PRIZES.

Questions set on examination for the Sir F. Fitzwygram Veterinary Prizes, 1890.

Anatomy.

1. What is the Cœliac Axis? What does it divide into? What do the vessels supply? Give their distribution and anastomoses.
2. What is a true Vertebra? Describe the Atlas, giving the names only of what passes through its foramina.
3. Describe fully the Pneumogastric, or eighth pair of nerves.
4. Give the formation of the Rete Mirabile and the Circle of Willis.
5. Describe the Sphenoid Bone.

Pathology.

1. Describe the disease known as Actinomycosis, and also the microscopic appearance.
2. Why is the Distoma Hepaticum so called? Give its life-history and a short description of the disease it causes.
3. Describe the pathology (symptoms and treatment) of Ringworm.
4. What are the causes of bleeding from the Urethra? Give the treatment.
5. Describe the process known as Healing by Granulation.
6. Name the normal position of the Testicles in the Foal at birth; describe subsequent changes of position, and say at about what age. State the different positions in which they are found in Cryptorchids, and describe shortly the method of operating.

Physiology.

1. Describe fully the formation of a Tooth.
2. What would be the effect of a unilateral section of the Spinal Cord in the Dorsal region?
3. Describe the formation of bone from Hyaline Cartilage.
4. What is a Gland? What is the difference between Secretion and Excretion?
5. Describe the Circulation of the Fœtus.

MISCELLANEA.

HINTS ON HORSE-SHOEING.

An experienced horseman, in an address before a Minnesota Farmers' Institute, thus sums up some valuable advice on horse-shoeing:—"(1) Do not get your horse shod at all unless necessary, and when that necessity no longer exists let the shoe disap-

pear with it. (2) On no account allow the frog or bars to be cut or the sole thinned out. (3) See that the shoe is made to fit the foot, and not the foot to fit the shoe. (4) The less rasping done after the shoe is nailed on the better; if a correct fit has been obtained none will be necessary beyond a touch under each clinch sufficient to remove the horn fibres pushed through by the nails. (5) Never let shoes remain on longer than a month at the outside without being reset. (6) If it is absolutely necessary to have your horse shod with calkings ('calks'), have the calkings made as small and as short as possible, so that the frog may come to the ground. With all your getting, get frog pressure; and despite the possible sneers, smiles, or prophecies of evil of your blacksmith, always bear in mind the good old maxim: 'No frog, no foot; no foot, no horse.'"—*Agricultural Press.*

[There is much common sense in these remarks; and if owners of horses and shoeing-smiths carried out these "hints," horses would be spared much suffering and veterinary surgeons have fewer cases of incurable foot-diseases brought to their notice.—EDS.]

HORSE-TAMING AND TRAINING.

As most of our readers are aware, Mr. Sydney Galvayne is carrying out a series of demonstrations on horse-training at the Duke of Wellington's Riding School, Knightsbridge, which should, in our opinion, receive the support both of the veterinary profession and the breeders and rearers of horses, as doubtless hundreds of horses are rendered ill-tempered and vicious by ordinary and so-called horse-breaking. Mr. Galvayne says that "discarding the process of exhaustion as adopted by Rarey, he proceeds at once to educate the three most prominent senses of the untrained horse, namely, the sense of hearing, feeling, and seeing, taking care all the while to keep the animal in ignorance of its own strength." The demonstrations given of the various ways in which the system may be applied go far towards proving its practicability. Mr. Galvayne also shows considerable ingenuity in the expedients which he adopts in order to correct such habits as jibbing, shying, bolting, kicking, and other vices.

EXAMINATIONS OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

Mr. Rutherford writes that in Class "A" of the May Examinations (p. 492), †T. Healy, of the Dick College, should have been †T. G. HEATLEY.

† Marked thus, passed with *Very Great Credit.*

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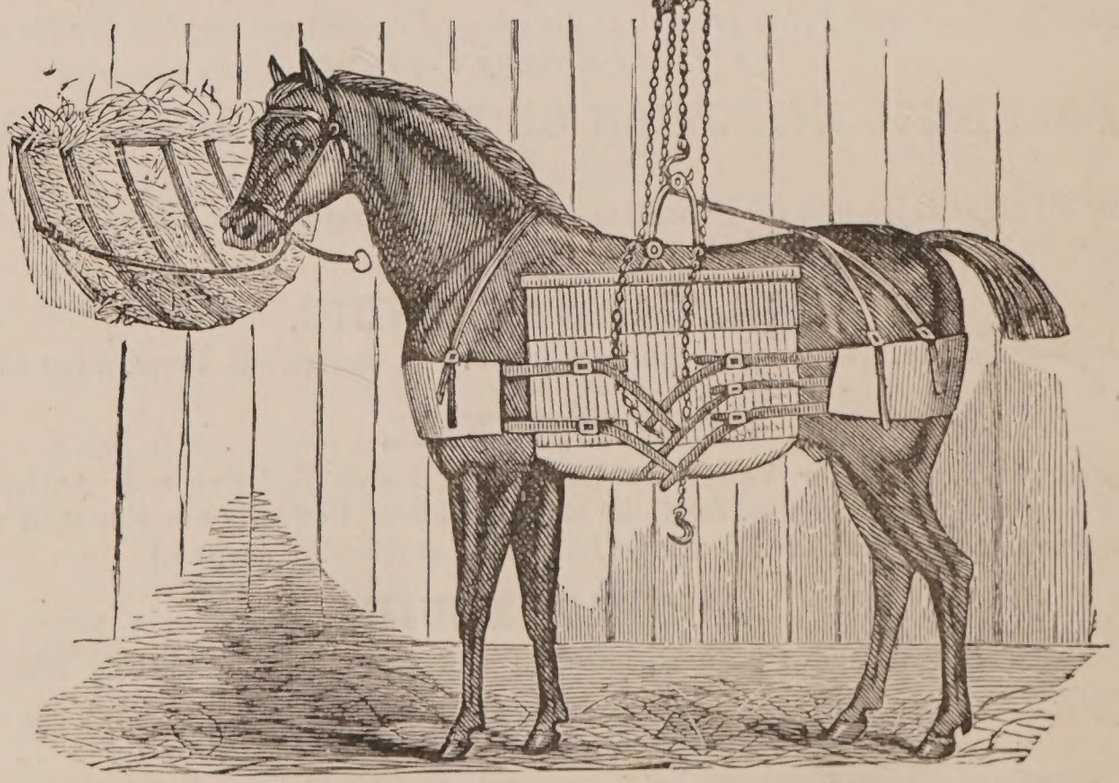

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A Subscription of *twenty guineas* entitles the Subscriber to all the privileges of the Institution, as a general Veterinary Establishment and Hospital for Animals, for life; and an annual payment of *two guineas*, to the same privileges during the continuance of such Subscription.

A Subscriber is entitled to have admitted into the Hospital for medical and surgical treatment, an unlimited number of Horses or other animals, his own property, at a charge only for their keep. Also, without the payment of fees, to have the opinion of the Professors as to the treatment of any animal he may wish to retain in his own establishment.

A Subscriber has likewise the privilege of having five horses examined *as to soundness* in the course of a year, and to receive the opinion of the Professors thereon, either verbally or in writing, free of charge; and also any further number at a fee of ten shillings and sixpence for each *extra* horse, or to have ten horses examined on payment, in addition to his Annual Subscription, of two guineas, or such other sum as shall from time to time be fixed by the Governing Body or General Purposes Committee.

The Professors do not examine horses for soundness out of the Institution, nor do they visit patients, except on very special occasions, and then only with the object of their being removed into the Hospital for treatment.

Members of the Royal Agricultural Society of England are entitled to all the privileges of Subscribers to the Institution, as appertaining to the diseases of Animals.

The Hospital and general Practice of the College is conducted by Professors Axe and Penberthy.

The Hospital contains ample accommodation for upwards of 100 Horses, besides Cattle, Sheep, Dogs, and other animals. It is fitted up with large and airy Loose-boxes and Stalls; Hot, Cold, Douche, and Vapour Baths; Operating Rooms, Covered Exercising Ground &c. Rooms are specially set apart as an Infirmary for Dogs.

ROYAL VETERINARY COLLEGE.

By the Royal Charter of Incorporation the GOVERNORS have power "to confer upon and grant to such of the Students of the said College as they shall think fit, *Annual or other Exhibitions, Scholarships, Medals and other Prizes and Certificates of Distinction.*"

A SCHOLARSHIP of £25 per annum, tenable for two years, was awarded for the year ending June 30th, 1888; and an additional Scholarship of the same amount will be awarded in 1889. Beside the COLEMAN PRIZE MEDALS; CLASS MEDALS, PRIZES AND CERTIFICATES are given in each division of the Students' studies.

In addition to these Prizes the Royal Agricultural Society awards a *Silver* and a *Bronze Medal* to the two Students who may pass the best examination in the Pathology of Cattle, Sheep, and Pigs, at the Diploma Examination of the Royal College of Veterinary Surgeons.

The College Entrance Fee is *Sixty Guineas;* the payment of which confers the right of attendance on *all* the Lectures and Collegiate Instructions. The fee may be paid in *three* instalments, viz., Twenty guineas on *entry*, Twenty guineas at the end of the *first period* of study, and Twenty guineas at the *second period* of study—the first instalment must, with the Matriculation Examination Fee of One guinea, as well as the Library and Reading Room Fee of One guinea, be paid prior to this Examination.

A Pupil, previously to his admission, is required to produce a recognised Certificate of Educational Acquirements, which must include all the pass subjects of the Matriculation Examination, or otherwise he must pass an Examination in *Writing, Reading aloud, Dictation, English Grammar, English History, Geography, Arithmetic, and French, German, or Latin.* A Pupil may also elect to be examined in any of the following subjects, *not exceeding two:*—Euclid, Books one and two; Algebra to Quadratic Equations inclusive; Natural History (Botany, Geology, or Zoology); Physiology; Chemistry; Physics; and the Greek, German, or Italian Languages.

The Educational Year is divided into a Summer and Winter Session of three terms, and begins on Oct. 1st and ends the middle of May.

Lectures, Clinical and Pathological, Demonstrations, and General Instruction, are given on Diseases of the Horse and other Domesticated Animals, including Epizöotics, Parasites and Parasitic Affections; also on Anatomy, Physiology, Histology, Chemistry (General and Practical), Materia Medica, Toxicology, Botany, Therapeutics and Pharmacy; Hospital Practice; Obstetrics; Operative Surgery, The Principles and Practice of Shoeing, &c.

Besides these Lectures and Demonstrations, the facilities which exist in the Institution are such as to enable Pupils, by attention to their duties, to acquire a well-grounded practical knowledge of their profession, and thus, on obtaining their Diploma, to at once merit the confidence of the public. This will become fully apparent when it is remembered that, for several past years, upwards of 2000 animals have been annually prescribed for and treated as GRATUITOUS PATIENTS *by the Pupils under the Supervision of the Teachers.*

In addition to the practical knowledge thus to be obtained, the pupils have the daily advantage of attending the Professors on their visits to the Patients in the Hospital, thereby becoming acquainted with the diagnosis and treatment of each individual case. Similar advantages are likewise enjoyed by them with reference to the Out-Patients. They also attend on the Professors in their Examinations of Horses for Soundness, the yearly average number of which exceeds 1000. It may be further added, as showing the advantage of the College for obtaining practical knowledge, that the number of animals admitted into the Hospital or treated as Out-Patients year by year exceeds 2000 or more than doubles those sent for examination as to soundness.

A Student, during his Academical Course, has to undergo *three* examinations by the Royal College of Veterinary Surgeons. To be eligible for the FIRST he is required to attend, *at least*, one Winter and one Summer Session; a second Winter and Summer Session before being eligible for the SECOND Examination, and a third Winter and Summer Session before being examined for the Diploma of the College.

The Examinations are held in May and December.

Educational Staff.

G. T. BROWN, C.B., Professor, Principal of the College and Lecturer on Contagious and Parasitic Diseases.
J. W. AXE, M.R.C.V.S., Professor of the Principles and Practice of Veterinary Medicine.
H. POWER, F.R.C.S., Professor of Physiology.
E. S. SHAVE, M.R.C.V.S., Professor of Anatomy.
J. PENBERTHY, F.R.C.V.S., Professor of Pathology and Therapeutics.
J. MACQUEEN, F.R.C.V.S., Professor of Botany and Histology.
J. BAYNE, Lecturer on Chemistry, Materia Medica, and Toxicology.
A. C. WILD, M.R.C.V.S., Demonstrator.
W. A. BYRNE, M.R.C.V.S., Hospital Surgeon.

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